

FIG. 1

Nucleic Acid Sequences

A. predicted cDNA sequence of AtFtn2 (SEQ ID NO:1)
(synonym: At5g42480; synonym: *ARC6*) gene

Sequence length = 2406 nt

Start codon (ATG) is at position 1-3

Stop codon (TAA) is at position 2404-2406

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1   ATGGAAGCTC TGAGTCACGT CGGCATTGGT CTCTCCCCAT TCCAATTATG CCGATTACCA
61  CCGGCGACGA CAAAGCTCCG ACGTAGCCAC AACACCTCTA CAACTATCTG CTCCGCCAGC
121 AAATGGGCCG ACCGTCTTCT CTCCGACTTC AATTTACCTT CCGATTCTCT CTCTCCTCC
181 TTCGCCACCG CCACCACCAC CGCCACTCTC GTCTCTCTGC CACCATCTAT TGATCGTCCC
241 GAACGCCACG TCCCCATCCC CATTGATTTT TACCAGGTAT TAGGAGCTCA AACACATTTC
301 TTAACCGATG GAATCAGAAG AGCATTCGAA GCTAGGGTTT CGAAACCGCC GCAATTCGGT
361 TTCAGCGACG ACGCTTTAAT CAGCCGGAGA CAGATTCTTC AAGCTGCTTG CGAAACTCTG
421 TCTAATCCTC GGTCTAGAAG AGAGTACAAT GAAGGTCTTC TTGATGATGA AGAAGCTACA
481 GTCATCACTG ATGTTCTTGT GGATAAGGTT CCTGGGGCTC TCTGTGTATT GCAAGAAGGT
541 GGTGAGACTG AGATAGTTCT TCGGGTTGGT GAGGCTCTGC TTAAGGAGAG GTTGCTAAG
601 TCGTTTAAGC AAGATGTGGT TTTAGTTATG GCGTTGCGT TTCTCGATGT CTCGAGGGAT
661 GCTATGGCAT TGGATCCACC TGATTTTATT ACTGGTTATG AGTTTGTTGA GGAAGCTTTG
721 AAGCTTTTAC AGGAGGAAGG AGCAAGTAGC CTTCACCCGG ATTTACGTGC ACAAATTGAT
781 GAGACTTTGG AAGAGATCAC TCCGCGTTAT GTCTTGAGC  TACTTGGCTT ACCGCTTGGT
841 GATGATTACG CTGCGAAAAG ACTAAATGGT TTAAGCGGTG TCGGGAATAT TTTGTGGTCT
901 GTTGGAGGAG GTGGAGCATC AGCTCTTGTT GGGGGTTTGA CCCGTGAGAA GTTTATGAAT
961 GAGGCGTTTT TACGAATGAC AGCTGCTGAG CAGGTTGATC TTTTGTAGC  TACCCCAAGC
1021 AATATTCAG CAGAGTCATT TGAAGTTTAC GAAGTTGCAC TTGCTCTTGT GGCTCAAGCT
1081 TTTATTGGTA AGAAGCCACA CCTTTTACAG GATGCTGATA AGCAATTCCA GCAACTTCAG
1141 CAGGCTAAGG TAATGGCTAT GGAGATTCCT GCGATGTTGT ATGATACACG GAATAATTGG
1201 GAGATAGACT TCGGTCTAGA AAGGGGACTC TGTGCACTGC TTATAGGCAA AGTTATGAA
1261 TGCCGTATGT GGTGCGCTT AGACAGTGAG GATTCACAAT ATAGGAATCC AGCTATTGTG
1321 GAGTTTGTTC TGGAGAATTC AAATCGTGAT GACAATGATG ATCTCCCTGG ACTATGCAAA
1381 TTGTTGGAAA CCTGGTTGGC AGGGGTTGTC TTTCTAGGT TCAGAGACAC CAAAGATAAA
1441 AAATTTAAAC TCGGGGACTA CTATGATGAT CCTATGGTTT TGAGTTACTT GGAAAGAGTG
1501 GAGGTAGTTC AGGGTTCTCC TTTAGCTGCT GCTGCAACTA TGGCAAGGAT TGGAGCCGAG
1561 CATGTGAAAG CTAGTGCTAT GCAGGCACTG CAGAAAGTTT TTCCTTCCCG CTATACAGAT
1621 AGAAACTCGG CTGAACCCAA GGATGTGCAA GAGACAGTGT TTAGTGTAGA TCCTGTTGGT
1681 AACAATGTAG GCCGTGATGG TGAGCCTGGT GTCTTTATTG CAGAAGCTGT AAGACCCTCT
1741 GAAACTTTG AACTAATGA TTATGCAATT CGAGCTGGGG TCTCAGAGAG TAGCGTTGAT
1801 GAAACTACTG TTGAAATGTC CGTTGCTGAT ATGTTAAAGG AGGCAAGTGT GAAGATCCTA
1861 GCTGCTGGTG TGGCAATTGG ACTGATTTCA CTGTTTCAAGC AGAAGTATTT TCTTAAAGC
1921 AGCTCATCTT TTCAACGCAA GGATATGGTT TCTTCTATGG AATCTGATGT CGCTACCATA
1981 GGGTCAGTCA GAGCTGACGA TTCAGAAGCA CTTCCAGAA TGGATGCTAG GACTGCAGAG
2041 AATATAGTAT CCAAGTGGCA GAAGATTAAG TCTCTGGCTT TTGGGCCTGA TCACCGCATA
2101 GAAATGTTAC CAGAGGTTTT GGATGGGCGA ATGCTGAAGA TTTGGACTGA CAGAGCAGCT
2161 GAAACTGCGC AGCTTGGGTT GGTTTATGAT TATACACTGT TGAACTATC TGTTGACAGT
2221 GTGACAGTCT CAGCAGATGG AACCCTGCTG CTGGTGGAAG CAACTCTGGA GGAGTCTGCT
2281 TGTCTATCTG ATTTGGTTCA TCCAGAAAAC AATGCTACTG ATGTCAGAAC CTACACAACA
2341 AGATACGAAG TTTTCTGGTC CAAGTCAGGG TGGAAAATCA CTGAAGGCTC TGTTCTTGCA
2401 TCATAA
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"Replacement Sheet"

FIG. 1 continued 2/6

B. Genomic sequence of AtFtn2 gene (SEQ ID NO:2 SEQ ID NO:3)
synonym: At5g42480; synonym: ARC6)

Sequence length = 3667 nt

This sequence contains 480 nt of the 5' and 149 nt of the 3' region

Start codon (ATG) is at position 481-483

Stop codon (TAA) is at position 3516-3518

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1   TGTTCCTGCAT TAAGGAGAAT ACAATTATAA GCAATTTGTC TTGATTTCAA CAAGATTTTG
61  CTTGGCTATA GGATTCATTG GCTCTGTTTG CTTTACATT TACATGTCAT AATAGTTTCG
121 AATTTTACAC ATTTTCAGTTG GATGTTAAGA AAAGAGAGGG AATTGATGGG GTTTTGTGGG
181 TTTAACTTT AAAGTAGTCA AGAATTAAGT CATTGGTTTA CTGTTGCTCT ATATGTGTAA
241 AATGAAGGCA ACTCCAACGG TTCTTAGGTG GAATAGATTA TTTAGACGAT TTAACATCAT
301 AAAGTCCGTG GCGACTGTAA CATCATAGAT TGTTTTTTAT TTTTTCAGT AGCTGGTGAT
361 GTTTTTTGAT TTAACCTTATA CTACTCAAAA TCAAAATTCC ATAAACCCTA GACGACCAAA
421 CAGTCTCTTC AATATGTAAA ACAGAACAAA GTTTTTGTAG TAGCCTAAAA AGACACTCCC
481 ATGGAAGCTC TGAGTCACGT CGGCATTGGT CTCTCCCAT TCCAATTATG CCGATTACCA
541 CCGGCGACGA CAAAGCTCCG ACGTAGCCAC AACACCTCTA CAACTATCTG CTCCGCCAGC
601 AAATGGGCCG ACCGTCTTCT CTCCGACTTC AATTTACCT CCGATTCTCT CTCCTCCTCC
661 TTCGCCACCG CCACCACCAC CGCCACTCTC GTCTCTCTGC CACCATCTAT TGATCGTCCC
721 GAACGCCACG TCCCCATCCC CATTGATTTT TACCAGGTAT TAGGAGCTCA AACACATTTT
781 TTAACCGATG GAATCAGAAG AGCATTGCGA GCTAGGGTTT CGAAACGCC GCAATTCGGT
841 TTCAGCGACG ACGCTTTAAT CAGCCGGAGA CAGATTCTTC AAGCTGCTTG CGAAACTCTG
901 TCTAATCCTC GGTCTAGAAG AGAGTACAAT GAAGGTCTTC TTGATGATGA AGAAGCTACA
961 GTCATCACTG ATGTTCTTTG GGATAAGGTA ATTTGATTTT CGGAATAATA AAGTTTCTTC
1021 GTTTTAATTT CATGAATTGG ATAAAGGAAG GAACTTTTAT CTAGTGAAGG TTCCTGGGGC
1081 TCTCTGTGTA TTGCAAGAAG GTGGTGAGAC TGAGATAGTT CTTCGGGTTG GTGAGGCTCT
1141 GCTTAAGGAG AGGTTGCCTA AGTCGTTTAA GCAAGATGTG GTTTTAGTTA TGGCGCTTGC
1201 GTTCTCGAT GTCTCGAGGG ATGCTATGGC ATTGGATCCA CCTGATTTTA TTAAGGTTA
1261 TGAGTTTGTG GAGGAAGCTT TGAAGCTTTT ACAGGTAGTT TGAATTGCTT TGGAATTTG
1321 ACGAGCGTTG GCTTTATAAG AACTTTCTTG ATTTGATACT TTGTTATTGA GTCTTGTGTA
1381 GGAGGAAGGA GCAAGTAGCC TTGACCCGGA TTTACGTGCA CAAATTGATG AGACTTTGGA
1441 AGAGATCACT CCGCGTTATG TCTTGAGACT ACTTGGCTTA CCGCTTGGTG ATGATTACGC
1501 TGCGAAAAGA CTAAATGGTT TAAGCGGTGT GCGGAATATT TTGTGGTCTG TTGGAGGAGG
1561 TGGAGCATCA GCTCTTGTG GGGGTTTGAC CCGTGAGAAG TTTATGAATG AGGCGTTTTT
1621 ACGAATGACA GCTGCTGAGC AGGTATACAG TTTAGATACC TTTTTTAAAT TTCTTTAGCA
1681 TGATATAACT TTAGGTTTCT CATTTTAATG TATGTTGTGT GGTAGGTTGA TCTTTTGTGA
1741 GCTACCCCAA GCAATATTCC AGCAGAGTCA TTTGAAGTTT ACGAAGTTGC ACTTGCTCTT
1801 GTGGCTCAAG CTTTTATTGG TAAGAAGCCA CACCTTTTAC AGGATGCTGA TAAGCAATTC
1861 CAGCAACTTC AGCAGGCTAA GGTAATGGCT ATGGAGATTC CTGCGATGTT GTATGATACA
1921 CGGAATAATT GGGAGATAGA CTTCGGTCTA GAAAGGGGAC TCTGTGCACT GCTTATAGGC
1981 AAAGTTGATG AATGCCGTAT GTGGTTGGGC TTAGACAGTG AGGATTCACA ATATAGGAAT
2041 CCAGCTATTG TGGAGTTTGT TTTGGAGAAT TCAAATCGTG ATGACAATGA TGATCTCCCT
2101 GGAATATGCA AATTGTTGGA AACCTGGTTG GCAGGGGTTG TCTTCTCTAG GTTCAGAGAC
2161 ACCAAAGATA AAAAATTAA ACTCGGGGAC TACTATGATG ATCCTATGGT TTTGAGTTAC
2221 TTGGAAAGAG TGGAGGTAGT TCAGGGTTCT CTTTATAGCT CTGCTGCAAC TATGGCAAGG
2281 ATTGGAGCCG AGCATGTGAA AGCTAGTGCT ATGCAGGCAC TGCAGAAAGT TTTTCTTCC
2341 CGCTATACAG ATAGAACTC GGCTGAACCC AAGGATGTGC AAGAGACAGT GTTTAGTGTA
2401 GATCCTGTTG GTAACAATGT AGGCCGTGAT GGTGAGCCTG GTGTCTTTAT TGCAGAGCT
2461 GTAAGACCCT CTGAAAACCT TGAACTAAT GATTATGCAA TTCGAGCTGG GGTCTCAGAG
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FIG. 1 continued 3/6

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2521 AGTAGCGTTG ATGAAACTAC TGTGAAATG TCCGTTGCTG ATATGTTAAA GGAGGCAAGT
2581 GTGAAGATCC TAGCTGCTGG TGTGGCAATT GGA CTGATT CACTGTT CAG CCAGAAGTAT
2641 TTTCTTAAAA GCAGCTCATC TTTTCAACGC AAGGATATGG TTTCTTCTAT GGAATCTGAT
2701 GTCGCTACCA TAGGTATGAT TAAATGATGC AATTTTCATA TATCTGCATT GCTCAAAATA
2761 TGCTTGTTTT GTGAGCTAAG AACATAGTTC CCACTTAATA CATGTCCCAA AAGTTGTACC
2821 AAGATTAACA AGTTGCTGAG TAAATTTT CAC TAATTATGCT GCTTGAATTT TTTGATCAAA
2881 CTGTAGACAG AAATGTAAAT TTCACTCTCA ACATTTCTGT TTAGAATAAC GTAGGATTAG
2941 AGATTGCCTT AGTGTGGCTT TGTCCAAC TTCTTTCTTT GATTTTTTTC TTTTCGATTT
3001 AGGGTCAGTC AGAGCTGACG ATTCAGAAGC ACTTCC CAGA ATGGATGCTA GGA CTGCAGA
3061 GAATATAGTA TCCAAGTGGC AGAAGATTAA GTCTCTGGCT TTTGGGCCTG ATCACC GCAT
3121 AGAAATGTTA CCAGAGGTGA GGAATAAAT CTACAATTCA ATCAATTGTG TGA AACTGT
3181 TGGACATGAT TATAGTCTGG TGCCTTGTTT GATTCTGTTA TTTATAGGTT TTGGATGGGC
3241 GAATGCTGAA GATTTGGACT GACAGAGCAG CTGAAACTGC GCAGCTTGGG TTGGTTTATG
3301 ATTATACACT GTTGAACTA TCTGTTGACA GTGTGACAGT CTCAGCAGAT GGAACCCGTG
3361 CTCTGGTGGA AGCAACTCTG GAGGAGTCTG CTTGTCTATC TGATTTGGTT CATCCAGAAA
3421 ACAATGCTAC TGATGTCAGA ACCTACACAA CAAGATACGA AGTTTTCTGG TCCAAGTCAG
3481 GGTGGA AAT CACTGAAGGC TCTGTTCTTG CATCATAATA TACTCATATG TAGCATGTCT
3541 GAGCTTGCGA GATTCCTCTT GTTCTGTAAA TTCTCTCTCT AAGTTAGTGT TTATAAATGA
3601 ACACAAAAAA ATTAACGTTT TTGGCACACC CTTTTCCTTG ATCTAAACTA TAACATAAGG
3661 GCTACAA

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FIG. 1 continued 4/6

C. predicted cDNA sequence of mutated AtFtn2 gene (SEQ ID NO:9)
synonym: At5g42480; synonym: *ARC6*

Sequence length = 2406 nt

Start codon (ATG) is at position 1-3

Premature stop codon (TGA) is at position 973-975

Stop codon (TAA) is at position 2404-2406

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1   ATGGAAGCTC TGAGTCACGT CGGCATTGGT CTCTCCCCAT TCCAATTATG CCGATTACCA
61  CCGGCGACGA CAAAGCTCCG ACGTAGCCAC AACACCTCTA CAACTATCTG CTCCGCCAGC
121 AAATGGGCCG ACCGTCTTCT CTCCGACTTC AATTTACACT CCGATTCCCTC CTCCTCCTCC
181 TTCGCCACCG CCACCACCAC CGCCACTCTC GTCTCTCTGC CACCATCTAT TGATCGTCCC
241 GAACGCCACG TCCCCATCCC CATTGATTTT TACCAGGTAT TAGGAGCTCA AACACATTTT
301 TTAACCGATG GAATCAGAAG AGCATTTCGA GCTAGGGTTT CGAAACCGCC GCAATTCGGT
361 TTCAGCGACG ACGCTTTAAT CAGCCGGAGA CAGATTCTTC AAGCTGCTTG CGAAACTCTG
421 TCTAATCCTC GGTCTAGAAG AGAGTACAAT GAAGGTCTTC TTGATGATGA AGAAGCTACA
481 GTCATCACTG ATGTTCTTGG GGATAAGGTT CCTGGGGCTC TCTGTGTATT GCAAGAAGGT
541 GGTGAGACTG AGATAGTTCT TCGGGTTGGT GAGGCTCTGC TTAAGGAGAG GTTGCCTAAG
601 TCGTTTAAGC AAGATGTGGT TTTAGTTATG GCGCTTGCGT TTCTCGATGT CTCGAGGGAT
661 GCTATGGCAT TGGATCCACC TGATTTTATT ACTGGTTATG AGTTTGTGTA GGAAGCTTTG
721 AAGCTTTTAC AGGAGGAAGG AGCAAGTAGC CTTGCACCGG ATTTACGTGC ACAAATTGAT
781 GAGACTTTGG AAGAGATCAC TCCGCGTTAT GTCTTGAGC TACTTGGCTT ACCGCTTGGT
841 GATGATTACG CTGCGAAAAG ACTAAATGGT TTAAGCGGTG TCGGGAATAT TTTGTGGTCT
901 GTTGGAGGAG GTGGAGCATC AGCTCTTGTT GGGGGTTTGA CCCGTGAGAA GTTTATGAAT
961 GAGGCGTTTT TATGAATGAC AGCTGCTGAG CAGGTTGATC TTTTGTAGC TACCCCAAGC
1021 AATATTCCAG CAGAGTCATT TGAAGTTTAC GAAGTTGCAC TTGCTCTTGT GGCTCAAGCT
1081 TTTATTGGTA AGAAGCCACA CCTTTTACAG GATGCTGATA AGCAATTCCA GCAACTTCAG
1141 CAGGCTAAGG TAATGGCTAT GGAGATTCCT GCGATGTTGT ATGATACACG GAATAATTGG
1201 GAGATAGACT TCGGTCTAGA AAGGGGACTC TGTGCACTGC TTATAGGCAA AGTTGATGAA
1261 TGCCGTATGT GGTGTTGGCTT AGACAGTGAG GATTCACAAT ATAGGAATCC AGCTATTGTG
1321 GAGTTTGTGT TGGAGAATTC AAATCGTGAT GACAATGATG ATCTCCCTGG ACTATGCAAA
1381 TTGTTGGAAA CCTGGTTGGC AGGGGTTGTC TTTCTAGGT TCAGAGACAC CAAAATATAA
1441 AAATTTAAAC TCGGGGACTA CTATGATGAT CCTATGGTTT TGAGTTACTT GGAAAGAGTG
1501 GAGGTAGTTC AGGGTCTCTC TTTAGCTGCT GCTGCAGCTA TGGCAAGGAT TGGAGCCGAG
1561 CATGTGAAAG CTAGTGCTAT GCAGGCACTG CAGAAAGTTT TTCCTTCCCG CTATACAGAT
1621 AGAAACTCGG CTGAACCCAA GGATGTGCAA GAGACAGTGT TTAGTGTA TAGCTTGGT
1681 AACAAATGTAG GCCGTGATGG TGAGCCTGGT GTCTTTATTG CAGAAGCTGT AAGACCTCT
1741 GAAAACTTTG AAACATAATGA TTATGCAATT CGAGCTGGGG TCTCAGAGAG TAGCGTTGAT
1801 GAAACTACTG TTGAAATGTC CGTTGCTGAT ATGTTAAAGG AGGCAAGTGT GAAGATCCTA
1861 GCTGCTGGTG TGGCAATTGG ACTGATTTCA CTGTTTCAGC AGAAGTATTT TCTTAAAGC
1921 AGCTCATCTT TTCAACGCAA GGATATGGTT TCTTCTATGG AATCTGATGT CGCTACCATA
1981 GGGTCAGTCA GAGCTGACGA TTCAGAAGCA CTTCCAGAA TGGATGCTAG GACTGCAGAG
2041 AATATAGTAT CCAAGTGGCA GAAGATTAAG TCTCTGGCTT TTGGGCCTGA TCACCGCATA
2101 GAAATGTTAC CAGAGGTTTT GGATGGGCGA ATGCTGAAGA TTTGGACTGA CAGAGCAGCT
2161 GAACTGCGC AGCTTGGGTT GGTTTATGAT TATACACTGT TGAACTATC TGTTGACAGT
2221 GTGACAGTCT CAGCAGATGG AACCCGTGCT CTGGTGGAAG CAACTCTGGA GGAGTCTGCT
2281 TGTCTATCTG ATTTGGTTCA TCCAGAAAAC AATGCTACTG ATGTCAGAAC CTACACAACA
2341 AGATACGAAG TTTTCTGGTC CAAGTCAGGG TGGAAAATCA CTGAAGGCTC TGTTCTTGCA
2401 TCATAA

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FIG. 1 continued 5/6

D. Genomic sequence of mutated AtFtn2 gene (SEQ ID NO:10) (synonym: At5g42480; synonym: ARC6)

Sequence length = 3667 nt

This sequence contains 480 nt of the 5' and 149 nt of the 3' region

Start codon (ATG) is at position 481-483

Premature stop codon (TGA) is at position 1622-1624

Stop codon (TAA) is at position 3516-3518

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1   TGTTCATGCAT TAAGGAGAAT ACAATTATAA GCAATTTGTC TTGATTTCAA CAAGATTTTG
61  CTTGGCTATA GGATTCATTG GCTCTGTTTG CTTTACATT TACATGTCAT AATAGTTTCG
121 AATTTTACAC ATTTCAAGTG GATGTTAAGA AAAGAGAGGG AATTGATGGG GTTTTGTGGG
181 TTTAACTTTT AAAAGTAGTCA AGAATTAAGT CATTGGTTTA CTGTTGCTCT ATATGTGTAA
241 AATGAAGGCA ACTCCAACGG TTCTTAGGTG GAATAGATTA TTTAGACGAT TTAACATCAT
301 AAAGTCCGTG GCGACTGTAA CATCATAGAT TGTTTTTTAT TTTTTCAGT AGCTGGTGAT
361 GTTTTTTGAT TTAAGTTATA CTACTCAAAA TCAAAATTCC ATAAACCCTA GACGACCAAA
421 CAGTCTCTTC AATATGTAAA ACAGAACAAA GTTTTTGTAG TAGCCTAAAA AGACACTCCC
481 ATGGAAGCTC TGAGTCACGT CGGCATTGGT CTCTCCCCAT TCCAATTATG CCGATTACCA
541 CCGCGACGCA CAAAGCTCCG ACGTAGCCAC AACACCTCTA CAACTATCTG CTCCGCCAGC
601 AAATGGGCCG ACCGTCTTCT CTCCGACTTC AATTTACCT CCGATTCTCT CTCCTCCTCC
661 TTCGCCACCG CCACCACCAC CGCCACTCTC GTCTCTCTGC CACCATCTAT TGATCGTCCC
721 GAACGCCACG TCCCCATCCC CATTGATTTT TACCAGGTAT TAGGAGCTCA AACACATTTT
781 TTAACCGATG GAATCAGAAG AGCATTTCGAA GCTAGGGTTT CGAAACCGCC GCAATTCGGT
841 TTCAGCGACG ACGCTTTAAT CAGCCGGAGA CAGATTCTTC AAGCTGCTTG CGAAACTCTG
901 TCTAATCCTC GGTCTAGAAG AGAGTACAAT GAAGGTCTTC TTGATGATGA AGAAGCTACA
961 GTCATCACTG ATGTTTCCTG GGATAAGGTA ATTTGATTTT CGGAATAATA AAGTTTCTTC
1021 GTTTTAATTG CATGAATTGG ATAAAGGAAG GAACTTTTAT CTAGTGAAGG TTCCTGGGGC
1081 TCTCTGTGTA TTGCAAGAAG GTGGTGAGAC TGAGATAGTT CTTGCGGTTG GTGAGGCTCT
1141 GCTTAAGGAG AGGTTGCCTA AGTCGTTTAA GCAAGATGTG GTTTTAGTTA TGGCGCTTGC
1201 GTTTCTCGAT GTCTCGAGGG ATGCTATGGC ATTGGATCCA CCTGATTTTA TTACTGGTTA
1261 TGAGTTTGTT GAGGAAGCTT TGAAGCTTTT ACAGGTAGTT TGACTTGCTT TGCTTGTGTA
1321 ACGAGCGTTG GCTTTATAAG AACTTTCTTG ATTTGATACT TTGTTATTGA GTCTTGTGTA
1381 GGAGGAAGGA GCAAGTAGCC TTGCACCGGA TTTACGTGCA CAAATTGATG AGACTTTGGA
1441 AGAGATCACT CCGCGTTATG TCTTGAGACT ACTTGGCTTA CCGCTTGGTG ATGATTACGC
1501 TGCGAAAAGA CTAAATGGTT TAAGCGGTGT GCGGAATATT TTGTGGTCTG TTGGAGGAGG
1561 TGGAGCATCA GCTCTTGTG GGGGTTTGAC CCGTGAGAAG TTTATGAATG AGGCGTTTTT
1621 ATGAATGACA GCTGCTGAGC AGGTATACAG TTTAGATACC TTTTTTTAAT TTCTTTAGCA
1681 TGATATAACT TTAGGTTTCT CATTTTAATG TATGTTGTGT GGTAGGTTGA TCTTTTTGTA
1741 GCTACCCCAA GCAATATTCC AGCAGAGTCA TTTGAAGTTT ACGAAGTTGC ACTTGCTCTT
1801 GTGGCTCAAG CTTTTATTGG TAAGAAGCCA CACCTTTTAC AGGATGCTGA TAAGCAATTC
1861 CAGCAACTTC AGCAGGCTAA GGTAATGGCT ATGGAGATTC CTGCGATGTT GTATGATACA
1921 CGGAATAATT GGGAGATAGA CTTGCGTCTA GAAAGGGGAC TCTGTGCACT GCTTATAGGC
1981 AAAGTTGATG AATGCCGTAT GTGGTTGGGC TTAGACAGTG AGGATTCACA ATATAGGAAT
2041 CCAGCTATTG TGGAGTTTGT TTTGGAGAAT TCAAATCGTG ATGACAATGA TGATCTCCCT
2101 GGACTATGCA AATTGTTGGA AACCTGGTTG GCAGGGGTTG TCTTTCCTAG GTTCAGAGAC
2161 ACCAAAGATA AAAAATTTAA ACTCGGGGAC TACTATGATG ATCCTATGGT TTTGAGTTAC
2221 TTGGAAAGAG TGGAGGTAGT TCAGGGTTCT CTTTAGCTG CTGCTGCAGC TATGGCAAGG
2281 ATTGGAGCCG AGCATGTGAA AGCTAGTGCT ATGCAGGCAC TGCAGAAAGT TTTTCTTCC
2341 CGCTATACAG ATAGAACTC GGCTGAACCC AAGGATGTGC AAGAGACAGT GTTTAGCTA
2401 GATCCTGTTG GTAACAATGT AGGCCGTGAT GGTGAGCCTG GTGTCTTTAT TGCAGAAGCT
2461 GTAAGACCTT CTGAAAACCT TGAACTAAT GATTATGCAA TTCGAGCTGG GGTCTCAGAG
2521 AGTAGCGTTG ATGAACTAC TGTTGAAATG TCCGTTGCTG ATATGTTAAA GGAGGCAAGT

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FIG. 1 continued 6/6

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2581 GTGAAGATCC TAGCTGCTGG TGTGGCAATT GGA CTGATTT CACTGTTCAG CCAGAAGTAT
2641 TTTCTTAAAA GCAGCTCATC TTTTCAACGC AAGGATATGG TTTCTTCTAT GGAATCTGAT
2701 GTCGCTACCA TAGGTATGAT TAAATGATGC AATTTTCATA TATCTGCATT GCTCAAAATA
2761 TGCTTGTTTT GTGAGCTAAG AACATAGTTC CCACTTAATA CATGTCCCAA AAGTTGTACC
2821 AAGATTAACA AGTTGCTGAG TAAATTTTAC TAATTATGCT GCTTGAATTT TTTGATCAAA
2881 CTGTAGACAG AAATGTAAAT TTCACTCTCA ACATTTCTGT TTAGAATAAC GTAGGATTAG
2941 AGATTGCCCTT AGTGTGGCTT TGTCCAACTT TTCTTTTCTT GATTTTTTTT TTTTCGATTT
3001 AGGGTCAGTC AGAGCTGACG ATTCAGAAGC ACTTCCCAGA ATGGATGCTA GGA CTGCAGA
3061 GAATATAGTA TCCAAGTGGC AGAAGATTAA GTCTCTGGCT TTTGGGCCTG ATCACC GCAT
3121 AGAAATGTTA CCAGAGGTGA GGAATAAAT CTACAATTCA ATCAATTGTG TGAAAACTGT
3181 TGGACATGAT TATAGTCTGG TGCCTTGTTT GATTCTGTTA TTTATAGGTT TTGGATGGGC
3241 GAATGCTGAA GATTTGGA CTGAGAGCAG CTGAAACTGC GCAGCTTGGG TTGGTTTATG
3301 ATTATACACT GTTGAAACTA TCTGTTGACA GTGTGACAGT CTCAGCAGAT GGAACCCGTG
3361 CTCTGGTGGA AGCAACTCTG GAGGAGTCTG CTTGTCTATC TGATTTGGTT CATCCAGAAA
3421 ACAATGCTAC TGATGTCAGA ACCTACACAA CAAGATACGA AGTTTCTGG TCCAAGTCAG
3481 GGTGGAAAAAT CACTGAAGGC TCTGTTCTTG CATCATAATA TACTCATATG TAGCATGTCT
3541 GAGCTTGCGA GATTCTCTTT GTTCTGTAAA TTCTCTCTCT AAGTTAGTGT TTATAAATGA
3601 ACACAAAAAA ATTAACGTTC TTGGCACACC CTTTTCCTTG ATCTAAACTA TAACATAAGG
3661 GCTACAA

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FIG. 2

Amino Acid Sequences

A. predicted amino acid sequence of AtFtn2
(synonym: At5g42480; synonym: *ARC6*) protein

Sequence length = 801 aa

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1  MEALSHVGIG LSPFQLCRLP PATTKLRRSH NTSTTICSAS KWADRLLSDF NFTSDSSSSS
61  FATATTTATL VSLPPSIDRP ERHVPIPIDF YQVLGAQTHF LTDGIRRAFE ARVSKPPQFG
121 FSDDALISRR QILQAACETL SNPRSRREYN EGLLDDEEAT VITDVPWDKV PGALCVLQEG
181 GETEIVLRVG EALLKERLPK SFKQDVVLVM ALAFLDVSRD AMALDPPDFI TGYEFVEEAL
241 KLLQEEGASS LAPDLRAQID ETLEEITPRY VLELLGLPLG DDYAAKRLNG LSGVRNILWS
301 VGGGGASALV GGLTREKFMN EAFLRMTAAE QVDLFVATPS NIPAESFEVY EVALALVAQA
361 FIGKKPHLLQ DADKQFQQLQ QAKVMAMEIP AMLYDTRNNW EIDFGLERGL CALLIGKVDE
421 CRMWLGLDSE DSQYRNPAIV EFVLENSNRD DNDDLPLGLCK LLETWLAGVV FPRFRDTKDK
481 KFKLGDYDD PMVLSYLERV EVVQGSPLAA AATMARIGAE HVKASAMQAL QKVFPSTRYTD
541 RNSAEPKDVQ ETVFSVDPVG NNVGRDGEPG VFIAEAVRPS ENFETNDYAI RAGVSESSVD
601 ETTVEMSVAD MLKEASVKIL AAGVAIGLIS LFSQKYFLKS SSSFQRKDMV SSMESDVATI
661 GSVRADDSEA LPRMDARTAE NIVSKWQKIK SLAFGPDHRI EMLPEVLDGR MLKIWTDRAA
721 ETAQLGLVYD YTLLKLSVDS VTVSADGTRA LVEATLEESA CLSDLVHPEN NATDVRTYTT
781 RYEVFWSKSG WKITEGSVLA S*
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B. predicted amino acid sequence of mutated AtFtn2
(synonym: At5g42480; synonym: *ARC6*) protein

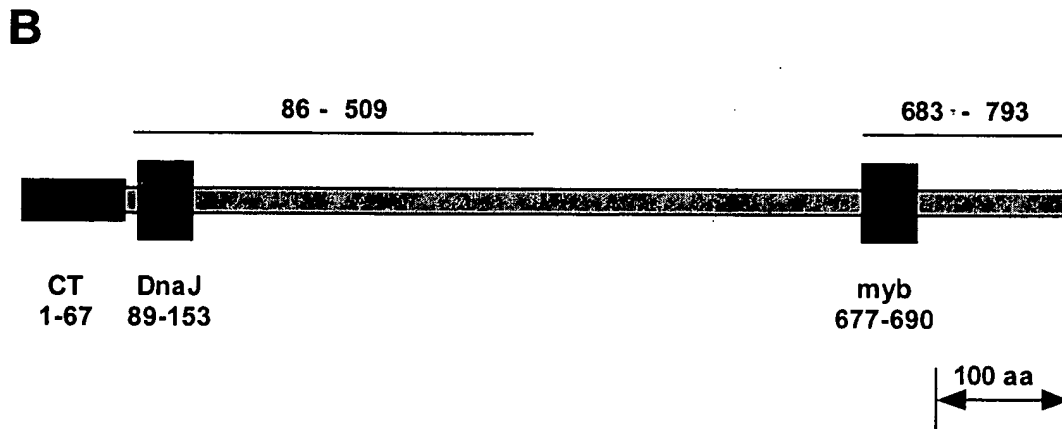
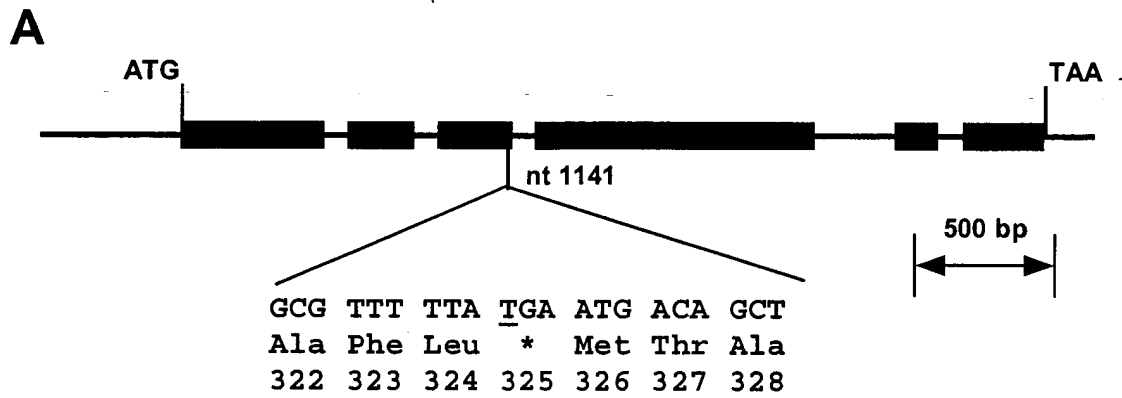
Sequence length = 324 aa

The mutated protein is truncated as a result of arc6 mutation
(premature stop)

```

1  MEALSHVGIG LSPFQLCRLP PATTKLRRSH NTSTTICSAS KWADRLLSDF NFTSDSSSSS
61  FATATTTATL VSLPPSIDRP ERHVPIPIDF YQVLGAQTHF LTDGIRRAFE ARVSKPPQFG
121 FSDDALISRR QILQAACETL SNPRSRREYN EGLLDDEEAT VITDVPWDKV PGALCVLQEG
181 GETEIVLRVG EALLKERLPK SFKQDVVLVM ALAFLDVSRD AMALDPPDFI TGYEFVEEAL
241 KLLQEEGASS LAPDLRAQID ETLEEITPRY VLELLGLPLG DDYAAKRLNG LSGVRNILWS
301 VGGGGASALV GGLTREKFMN EAFL*
```

FIG. 3



Q9SAG8/55-115	DPFKTLGRPD	SSSVE	WKAQROMAKKYPDPVCRGN	CGV	QFTNPAVDVILKQ	IKQOME
P93499/67-134	SLVDLCHPAG	ASSQE	IKAAVRRIRKCHPDVAAD	---	FKKHAAVSTLSDP	DGRANVD-RSL
Q48828/68-135	SIXEILHPVG	STSQE	IKSAVRRIRKCHPDVARN	---	FKKHAAVCTLSDP	EGRAYVD-RRT
DNJL_MYCEN/2-64	TIYDLLEHPQT	ATIQE	IKTAVRRIRKRYHPDINKQ	---	FVKHNAVAVLSP	TQGAEVD-AML
DNJL_MYCE/2-64	NIYDLLEHPPT	ASTKE	IKTAVRRIRKRYHPDVNKL	---	FVKHNNVAVLSP	NQREKYD-SML
Q9SDN0/66-133	SPYDLLEHTS	VTLPE	IKQAVKQAKRYHPDPVPPD	---	FVKQBAVETLSDP	REVLIVD-RDL
Q9VKT2/31-99	NCYDLLEVTRE	SSKSE	IKAVRQIRKRYHPDLHRGA	---	FKLAVAVETLSDP	ESTDYD-YML
Q17433/36-105	NCYDLLEVNREE	FDQKQ	IKAAVRRIRKCHPDVAVKN	---	FKVATAVETLSDP	EAKTNDV-YYL
Q9SH08/76-147	SPYDLLEMDRN	AEESEQ	IKTAVRRIRKRYHPDVGDKG	---	FKTQAAVETLSDP	EKKVQYD-MDN
Q94567/6-73	KLYDLLEHFE	ASABE	IKQSAVRRIRKLLHPDKAPIH	---	FKGQBAVETLSDP	ESSEMYD-MYGS
*maize	DFYKVLGAEP	HFLGD	GIRRAVEER-IAKPPQYGYG-TEALAGRRQ	---	MEQIADHTLQNO	NSQTEYD-RALS
*rice/97-162	DFYKVLGAEP	HFLGD	GIRRAVEER-IAKPPQYGYG-TDALVGRRQ	---	MEQIADHTLQNO	NSQTEYD-RALS
*potato/109-174	DFYKVLGAEA	HFLGD	GIRRAVEER-IATKPPQYGYG-QEALIGRRQ	---	IKQACETLSDP	TSREVN-QGLA
*Mtrunc/	DIYKVLGAET	HFLTD	GIRRAVEAR-FSKPPQYAFS-NEALISRRQ	---	IKQACETLSDP	ASREYN-QSLV
*Athal/89-154	DFYKVLGAQT	HFLTD	GIRRAVEAR-FSKPPQYAFS-DDALISRRQ	---	IKQACETLSDP	RSREYN-EGLL
*Pm MED4/6-71	DHERVLGVSP	SATSE	EILRAEQLR-LDKTPDEGFT-VEYLQORSE	---	LARLADLTLSDP	DSRDYE-NLLL
*Pm_MIT91313/11-76	DHERVLGVSP	SADSE	ALILALELR-LDRCPDGGFT-HEVLQORAE	---	LARLADLTLSDP	PERQAE-TALL
*Sec WH8102/6-71	DHERVLGVSP	SADPA	SILRLQETR-SDSPDPDGGFT-HEGLQORQA	---	LARLADLTLSDP	SEBADIYEAAL
*Syn_PCC6803/6-71	DYRVLGVHPP	QSGGE	TIQCAVDR-LQLPKEEFS-DAAVILNRQ	---	LARLADLTLSDP	EKKVQYD-QEWM
*Nostoc/6-71	DYRVLGVHPL	AASSE	QIRCAVSDR-IVQLPKEEYS-QAAIISRRQ	---	LARLADLTLSDP	KQSTYD-QLYL
*Anabena/16-81	DYRVLGVHPL	AASDE	QIRCAVSDR-IVQLPKEEYS-QAAIASRRQ	---	LARLADLTLSDP	KQSTYD-QLYL
Q9UGV7/17-82	DYRVLGVHPL	NSITVE	CITAEVRIER-LQHPDKNDG-EKEAEKFFQ	---	LARLADLTLSDP	KQSTYD-QLYL
Q9TVP3/17-82	DYRVLGVHPL	NSSPPE	QIRCAVSDR-LQHPDKNDG-EKEAEKFFQ	---	LARLADLTLSDP	KQSTYD-QLYL
Q9VNV22/14-79	DYRVLGVHPL	SSSVE	QIRCAVSDR-LQHPDKNDG-EKEAEKFFQ	---	LARLADLTLSDP	KQSTYD-QLYL
Q9VNV28/708-772	DYRVLGVHPL	SSSVE	QIRCAVSDR-LQHPDKNDG-EKEAEKFFQ	---	LARLADLTLSDP	KQSTYD-QLYL
O97211/9-72	ELVYVLEDA	QCTTA	EISQVRRIRKRYHPDNAG	---	ATVEQFQ	---
O13601/12-78	DYRVLGVHPL	SSSVE	QIRCAVSDR-LQHPDKNDG-EKEAEKFFQ	---	LARLADLTLSDP	KQSTYD-QLYL
O94566/12-78	DYRVLGVHPL	SSSVE	QIRCAVSDR-LQHPDKNDG-EKEAEKFFQ	---	LARLADLTLSDP	KQSTYD-QLYL
Q9UUG3/2-69	NHYSVLEKOGK	TYTDD	EIKAVRRIRKLLHPDKCK-EKPSVVYTDQ	---	WKEAVVILSE	KDPOQY-IKQ

10

[illegible]

11

[illegible][illegible][illegible]

12

	710	720	730	740	750	760	770	780	790	800
Anabena	.....|.....|.....|.....|.....|.....|.....|.....|.....|.....|.....|	555	QSTP	PRQT	KRRRK-----	-KQAVNRGHS	IHQQRQ	SPTS--TLGRKTRLWIVLSGLGGILLFWLI	VTTFGWLKNVFPFAPSGDSIQISQPPL	
Nostoc	.....|.....|.....|.....|.....|.....|.....|.....|.....|.....|.....|	525	KSAAGHNQ	RKRKKFTPSASRRI	PONRPHSRPRRRRTFANTIEGTRLVYWRVFSILSVLFVYLATTTFGWLKNLFRFPQSPDQLQVFQINQPL					
Pm_MED4	.....|.....|.....|.....|.....|.....|.....|.....|.....|.....|.....|	459	KIAELKF	VFGEALEN-----	-YRIFNKSSYLTYLAFLIIPAFGLGVGFVRNNLKPKVPQKEIIDNSLSIN--ENKNVFEGLNQDDKKXVLNQSNI					
Pm_T9313	.....|.....|.....|.....|.....|.....|.....|.....|.....|.....|.....|	453	EFASDGMWIDRLAD-----	-LPRTPRPVLITGSVVFAALTAAF-AGFSLFGQRPRTSVT-----AADQPGVTAPTATTQQEEV						
Syn_PCC6803	.....|.....|.....|.....|.....|.....|.....|.....|.....|.....|.....|	482	TNGIGGDST	SNRGSS-----NSAPESTSKHKSPPRRKRKVITPVRFGIILCLAGIVGATALLINRTG-----D--PLGGLEDLPDLVFDLPQSE						
Syn_PCC7002	.....|.....|.....|.....|.....|.....|.....|.....|.....|.....|.....|	497	PVTAALN-----	-PDPEASSASS-----KS--VSSKRSIGWGAIAAIVGSLVLLVGLRVLTSLGTQTQEPLQVT-----LNGEPIPTFILSDTAE						
Scc_WH8102	.....|.....|.....|.....|.....|.....|.....|.....|.....|.....|.....|	452	DPAHQRLS--NLRLRW-----	-LAASLVVGLVAALAANAAMLRPR-ETAPVVIQ--PEPDROD-----AVE-PKPSAQDSATILKPQA						
rice	.....|.....|.....|.....|.....|.....|.....|.....|.....|.....|.....|	531	VFPLEIQDRSAMENTKDGP	GGYLENFQENAFHDSNAALKIIISAGALFALLAIVCAKYL-----PKRKLPSAIRSEHGSGVAVA						
Athal	.....|.....|.....|.....|.....|.....|.....|.....|.....|.....|.....|	576	AVRPSENPETNDVAIRAGV	SESSVDETTVMESVADM LKEASVKILA GVA IGLISLSQKYF-----LKSSSFQRKDMVMSMESD						
potato	.....|.....|.....|.....|.....|.....|.....|.....|.....|.....|.....|	197								

FIG. 6

Synechococcus sp. PCC 7942 cell division protein Ftn2 gene

A. Ftn2 DNA nucleic acid sequence (SEQ ID NO:4)

```
1 cttgccgact aaaggctaag catgccatt ccttagatta aagcagtctg tcggcggcgc
61 tgtgccggtt aacaccagtc tgtcgtgac agcgggtcct ttctggggct tgcctgtggg
121 gcgagtaacc gatcgtggg ataagattg gtgcttctgg ctctcaagaa tagggtttc
181 cgtcgcgtat tcccgatcac atccccctgt gtctgctacg gagataacgc cgatcactca
241 acagaattgg taagttgacg gtcaagttgg gatgatgaag tcggctcaag ctggcgatcc
301 ggatctgggt ggtgttctgt gcgtattcct ctcgattact accgaattct ctgtgttggc
361 gtgcaagcct cggcagacaa acttgccgaa agctaccgag atcgctcaa ccaatcgccc
421 tcccatgagt tttagagctt ggcattgcag gcgcggcggc aactcctga agcagcgatt
481 gctgagctga gtatcccgga acagcgcgat cgctacgac gccgctttt tcagggcggt
541 ctggaagcga tgaaccaag cctagaactc gaagactggc agcgaattgg agccctgctg
601 atcctgctgg aattggggga atacgatcgc gtttcgcaac tggtgagga actcctgcca
661 gactacgacg cgagcgcaga agtacgcgat cagttcgcgc ggggtgatat cgccttggcg
721 atcgactat cccagcaatc cctcggtcga gaatgccgc agcagggctt gtacgaacag
781 gccgccagc actttggccg cagccagtct gccctagccg atcatcagcg ctttctgaa
841 ctgagtcgaa cctgcacca agaacaagga cagctacggc cctatcgcat ttggagcgg
901 ttggcccagc cttgactgc cgatagcgat cgccagcagg gtttctgtt gttgcaggcg
961 atgttgacg accggcagg cattgaaggc cctggggatg atggctcggg gctgaccctt
1021 gataactttt tgatgtttct ccagcaaatt cgcggctatc tgaccctggc tgaacagcag
1081 ttgtgtttg aatcggaagc gcgtcggccc tcgccggctg cgagctttt tgcctgctac
1141 accctgattg cgcggggctt ttgcgatcac caacctcgt tgatccatg cgccagctt
1201 ctcttgcatt aactcaagag ccgatggat gtgcacatg aacaggcgat cgccagccta
1261 ttgtcggac agcccgaaga agctgaggcg ctactctcc agagccaaga tgaggaaacc
1321 ctacgcaaaa tccgtgccct agcccaaggg gaagccctga tcgtcggttt gtgccgattc
1381 acggaaacct ggctagcgac caaggtattt ccggatttcc gcgacctcaa ggaaaggact
1441 gcgccgctgc agccctactt tgacgacccc gatgtccaga cctatctgga tgcgatcgtg
1501 gagttgccgt ccgatttgat gccaacgccg ctaccggtg agccgcttga ggtgcgatg
1561 tcgttgctgg ccaaggaact gccgaccca gcaacgcctg gtgtagctcc acccctcgc
1621 cgccgtgcc gcgatcctc cgaacgtcct gctcgacagg ccaaagcgtt gcccttgccc
1681 tggattggtt tgggggttgt ggtggttctc ggcgggtgaa caggggtttg ggcttggcga
1741 tcgcgttcca attccacccc gccgacccc cccccgtgg ttcaaagct gctgaggcg
```

FIG. 6 continued (2/2)

1801 gtacctgccc ctctgcccgc gccagttacc gttgccctcg atcgggctca ggctgaaact
1861 gtgttgcaaa actggttggc cgctaaagct gcagccttgg ggcctcaata cgatcgcgat
1921 cgcttagcga cgggtgctgac cggtgaggtt ctgcagactt ggcagggttt ttctagccag
1981 caggccaaca cccagctcac atcacagttc gatcacaagt taaccgtcga ctcatgtcag
2041 ctcatgtacg gtgatcaacg agcagtagtc caagccaagg tcgatgaagt tgagcaggtc
2101 tatcgaggcg accagctgct cgaaacgcgc cgagatttgg gcttggtgat ccgctaccag
2161 ctctgtgcgcg agaacaacat ctggaaaatt gcttcgatta gtttggtgcg cttaggaattc
2221 gcaaggggtg aacccctgc ggtctttct gtagatcccc tagagcgatc gcagaatgtt
2281 cagcgattcc tggatgtgcg ctggggcatt caagagtga tcaaaaatgt ggcgacacct
2341 gccctctttg tcgatcacat aagtgcgcgc acccggaatc acaaacaggg ttttgggcac
2401 gccatagggt tgacggaggc gatcgctgc atcgtcagc agttggaagg gcaagttgta
2461 ttctgggc

B. Ftn2 Protein amino acid sequence (SEQ ID NO:5)

translation="MRIPLDYRILCVGVQASADKLAESYRDRLNQSPSHEFSELALQ
ARRQLLEAAIAELSDPEQRDRYDRRFFQGGLEAIEPSLELEDWQRIGALLILLELGEY
DRVSQLAEE LLPDYDASAEVRDQFARGDIALAIALSQSLGRECRQQGLYEQA AQHFG
RSQSALADHQRFP ELSRTLHQEQQLRPYRILERLAQPLTADSDRQQGLLLLQAMLDD
RQGIEGPGDDGSGLTLDNFLMFLQQIRGYLT LAEQQLFESEARRPSPAASFFACYTL
IARGFCDHQPSLIHRASLLLHELKSRMDVHIEQAIASLLLGP EEEAEALLVQSQDEET
LSQIRALA QGEALIVGLCRFTETWLATKVFPDFRDLKERTAPLQPYFDDPDVQTYLDA
IVELPSDLMPTPLPVEPLEVRSSLLAKELPTPATPGVAPPPRRRRRDRSERPARTAKR
LPLPWIGLGVVVVLGGGTGVWAWRSRSNSTPPTPPPVVQTLPEAVPAPSPAPVTVALD
RAQAETVLQNWLA AKAALGPQYDRDRLATVLTGEVLQ TWQGFSSQQANTQLTSQFD
HKLTVDSVQLSDGDQRAVVQAKVDEVEQVYRGDQLLETRRDLGLVIRYQLVRENNIW
KIASISLVR"

FIG. 7

Synechococcus sp. PCC 7942 cell division protein Ftn6 gene

A. Ftn6 DNA nucleic acid sequence (SEQ ID NO:6)

```
1 ctcgatactt gggagttgaa cacagagtag tagtctaagt aacaactgct cgtgagcaat
61 ttgtacact tttacaaa tttgagctc agtttcgcg aaaactggga tgtgagttg
121 aacctcagc agcaaaattg taccgctga gactttacc gttttatcg gccatctggg
181 aacaatgcc ctggagctta ttgtacctc taccgtact gccgtattg ccttgtaga
241 acgtatttc gagctgtcgg cagcgcgagc agcagaggc ttgcagcaac tgcgatcga
301 ccacctgaa gcctggattt atcccgcac agtcgaggcg attaccaag gccgttaccg
361 ctgggtgtcg atgcacaaa tcttgctct gtggcagcgg cgcgggcaga tcaactgcca
421 ctcagtga gactatgagc gcttgttct cggatgaagt ccagagcaac ccgatcgcat
481 caatgtttag acgcggtcc ctgcgatgc catgacctg ccttgggtgc cagaacagcc
541 tggagaagca ttcgtgccag cgcaagatca gtcgggtta actgagcgcc ttataaaac
601 gttggtcaaa gcgggcagcg attgcgctgg gtaggcttag aacagttgcc atccaaactt
661 gagagtccc gtgcggccag ccaagagaat tccaagagcc ttcagaacg gacaacaatt
721 ctgctctaca atcaagccc agtgaagagg cggcgggcta ttgctgaat ggcaaaaaac
781 atcattctt cagcaatcgt gggttatacc tacgacaaa ttgacctatt cttacttct
841 gcactccga acacctcagc agatattct ttaattgcat caagtcctc agcccaactc
901 cgtcatcagt tattgagtc acctcgggtc aaactcgtt atgtgaacct tcaaggtgaa
961 ccagctgaaa tggatattcg ccgtttctt attgccaagg agattttggc gagaatcgaa
1021 gcagatgaaa ttctcttgag cgatgctgc gatgtctatt tccaatctga ccttttgg
1081 gtccaagggg tttatttgc cgaggaacct cagctaatc caaactgtaa agtcaatagc
1141 agctggataa aaaaatactt aggagaggat gagtttcaag ccatttctcc taatccaatt
1201 ctctgcgggg gcaaccatgt gctggatgcc accaaggcct ttagcctgac gttgaccaca
1261 ccagaagaaa ttgtgggct gcccagaggt ttgctggcct tggcggctca agctgctcaa
1321 gccgctggtg aaacagaggc aacaccgaa gccggccctt ggcgaatcac cctcgacttc
1381 ccaagctttg
```

B. Ftn6 Protein amino acid sequence (SEQ ID NO:7)

```
MGTIALELIVTSTRTAVIALLEYFELSAARAAEVLQQLRSHHP
EAWIYPATVEAIYQGRYRWVSIAQILALWQRRGQINCHFSADYERLLLGEVPEQP
DRINVETRLPAIAMTLPWVPEQPGFAFVPAQDQSGILTERLYKTLVKAGSDCAG
```

"Replacement Sheet"

FIG. 8

Additional Sequences

First Set

ACCESSION BK000999

SEQ ID NO:125:

MEGFHNLLARPNSAPFAFSLPRPRPRRRRPPPHPSAACRAASR
WAERLFADFHLLPTAAPSDPPSPAPAPAAAPSASPFVPLFPDAAERSLPLQVDFYKVL
GAEPHFLGDGIRRAFEARIAKPPQYGYSTDALVGRRQMLQIAHDTLMNQNSRTQYDRA
LSENREEALTMDIAWDKEAGEALAVLVTGEQLLLDRPPKRFKQDVVLAMALAYVDLSR
DAMAASPPDVIGCCEVLERALKLLQEDGASNLPDLLSQIDETLEEITPRCVLELLSL
PIDTEHHKKRQEGLOGARNILWSVGRGGIATVGGGFSREAFMNEAFLRMTSIEQMDF
SKTPNSIPPEWFEIYNVALAHVAQAIISKRPQFIMMADDLFEQLQKFNIGSHYAYDNE
MDLALERAFCSLLVGDVSKCRMWLGIDNESSPYRDPKILEFIVTNSSISEENDLLPGL
CKLLETWLIFEVFPSSRDTRGMQFRLGDYDDPEVLSYLERMEGGGASHLAAAAIAK
LGAQATAALGTVKSNAIQAFNKVFPLIEQLDRSAMENTKDGPGGYLENFDQENAPAH
SRNAALKIISAGALFALLAVIGAKYLPRKRPLSAIRSEHGSAVANSVDSTDDPALDE
DPVHIPRMDAKLAEDIVRWQSIKSKALGPEHSVASLQEVLDGNMLKVWTDRAAEIER
HGWFWYTLSDVTIDSITISLDGRRATVEATIDEAGQLTDVTEPRNNDSDTKYTTRY
EMAFSKLGGWKITEGAVLKS"

SEQ ID NO:126:

BASE COUNT 551 a 576 c 592 g 564 t

ORIGIN

1	atggaggggct	tccacaacct	cctcgcccg	cccaactcgg	cgccattcgc	cttctccctc
61	cctcgcccg	gcccgcgccc	gcgcgcgagg	ccgcccgcctc	acccctccgc	tgccctgccgc
121	gccgcgagcc	gctggggccga	acgcctcttc	gccgacttcc	acctcctccc	caccgcgcgcg
181	ccctccgacc	cgccgtcccc	ggccccggcc	ccggccgcgcg	cgccctccgc	ctcccccttc
241	gtcccgcctct	tccccgacgc	cgccgaacgc	tccctcccgc	tccaagtcca	tttctacaag
301	gttctagggg	cagagccaca	tttccttgcc	gatggcatca	ggagggcggt	cgaggcacgcg
361	atagccaagc	caccgcagta	tggtacagc	acggatgctc	ttgttggtcg	tcgacaaatg
421	ctgcagattg	cccatgacac	tctcatgaac	cagaactccc	gcactcagta	tgatcggtgcg
481	ctttctgaga	accgtgaaga	agctctcacc	atggatattg	cttgggacaa	ggaggctggg

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FIG. 8 continued 2/40

541 gaggcacttg ctgtgcttgt aactggagaa cagttgcttc tggatcggcc acccaagcgc
601 ttcaagcagg acgtggtgct agcgatggct ctggcttatg tggatctatc aagggatgct
661 atggcagcaa gccctccaga tgtaattggc tgctgcgagg tgctcgagag ggctctcaag
721 ctcttgcaagg aagatggagc aagcaatctc gcacctgacg tgctttcaca gattgatgaa
781 actctcgagg agattacacc tcgctgtgta ttggagcttc tctcccttcc tattgacaca
841 gagcatcata agaagcgcca agaagggtt caaggtgcga gaaacathtt gtggagcgtt
901 ggcagaggag gtattgctac cggttgagga ggattttctc gtgaagcctt catgaacgag
961 gcttttttga ggatgacatc aattgaacag atggattttct tttcaaaaac accgaatagc
1021 attcctcctg aatggtttga aatttacaat gtagcacttg cacatgtcgc tcaagcaatt
1081 ataagtaaaa ggccacaatt catcatgatg gcggatgatc tttttgaaca actccagaag
1141 ttcaacatag gttctcatta tgcttatgat aatgagatgg accttgcatt ggaaagggca
1201 ttctgctcat tgctagtcgg agatgttagc aagtgcagaa tgtggcttgg aattgataat
1261 gagtcttcac catacagaga ccccaaaatt ctagagttta ttgtgaccaa ctctagcatc
1321 agtgaagaga atgatcttct tccagggtcg tgcaagcttt tggagacttg gcttatcttt
1381 gaggtttttc ctaggagcag agatactcgg ggcattgcagt tcagacttgg agattactac
1441 gatgatccag aagttttaag ctacctagaa aggatggagg gtggtggtgc ttctcatttg
1501 gctgctgctg ctgctattgc aaaacttggg gctcaagcta cagctgcact tggtagctg
1561 aaatcaaagc ctattcaagc gttcaacaag gtttttccat tgatagaaca gttagacagg
1621 tcagccatgg aaaatactaa agatggccct gggggatatac ttgaaaattt tgaccaggaa
1681 aatgcacctg ctcatgattc gagaaatgcc gccttgaaga ttatctctgc tggcgactg
1741 tttgactgtg tggcagtaat tggggccaaa tatttgcttc gtaagaggcc cctttctgct
1801 attaggagtg agcatggatc tgtggcagtt gctaatagtg tcgactctac tgatgatcct
1861 gcactagatg aagatccagt acatattcct agaattggatg cgaagctggc agaagatatt
1921 gttcgcaagt ggcagagtat caaatctaag gccttgggac cagaacattc ggttgcatca
1981 ttgcaagagg ttcttgatgg caacatgcta aagggtgtgga ctgaccgagc agcggagatt
2041 gagcgtcatg ggtggttctg ggagtataca ctatccgatg tgacgattga tagcatcact
2101 atctccctag atggtcgacg agcgactgtg gaggctacga ttgatgaggc aggccaaactt
2161 actgatgtta ctgagcccag aaacaatgat tcatatgaca caaaatacac taccgggtat
2221 gagatggcct tctccaagct aggaggggtg aagataacgg aaggagcagt cctcaagtcg
2281 tag

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FIG. 8 continued 3/40

ACCESSION BAB10489

SEQ ID NO:127:

```
1 mealshvgig lspfqlcrlp pattklrrsh ntstticsas kwadrllsdf nftsdssssss
61 fatatttatl vspppsidrp erhvpipidf yqvlgaqthf ltdgirrafe arvskppqfg
121 fsddalisrr qilqaacetl snprsrreyn egllddeeat vitdvpwdkv pgalcylqeg
181 geteivlrvg eallkerlpk sfkqdvvlvm alafldivsrd amaldppdfi tgyefveeal
241 kllqeegass lapdlraqid etleeitpry vlellglplg ddyaakrlng lsgvrnilws
301 vggggasalv ggltrekfmn eaflrmtaae qvdlfvatps nipaesfevy evalalvaga
361 figkkphllq dadkqfqqlq qakvmameip amlydtrnnw eidfglergl calligkvde
421 crmwlgldse dsqyrnpaiv efvlensnrd dnddlpglck lletwlagvv fprfrdtkdk
481 kfkldgydd pmvlsylerv evvqgsplaa aaamarigae hvkasamqal qkvfpsrytd
541 rnsaepkdvg etvfsvdpvg nnvgrdgepg vfiaeavrps enfetndyai ragvsessvd
601 ettvemsvad mlkeasvkil aagvaiglis lfsqkyflks sssfqrkdmv ssmesdvati
661 gsvraddsea lprmdartae nivskwqkik slafgpdhri emlpevldgr mlkiwtdraa
721 etaqlglvyd ytllklsvds vtvsadgtra lveatleesa clsdlvhen natdvrtytt
781 ryevfwsksg wkitegsvla s
```

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"Replacement Sheet"

FIG. 8 continued 4/40

NM_123613.1 | (SEQ ID NO:128):

ATGGAAGCTCTGAGTCACGTCGGCATTGGTCTCTCCCCATTCCAATTATGCCGATTACCACCGGCGACGA
CAAAGCTCCGACGTAGCCACAACACCTCTACAATATCTGCTCCGCCAGCAAATGGGCCGACCGTCTTCT
CTCCGACTTCAATTTACCTCCGATTCTCTCTCTCTCTCGCCACCGCCACCACCACCGCCACTCTC
GTCTCTCCGCCACCATCTATTGATCGTCCCGAACGCCACGTCCCCATCCCCATTGATTTCTACCAGGTAT
TAGGAGCTCAAACACATTTCTTAACCGATGGAATCAGAAGAGCATTCTGAAGCTAGGGTTTCGAAACCGCC
GCAATTCGGTTTCAGCGACGACGCTTTAATCAGCCGGAGACAGATTCTTCAAGCTGCTTGCGAAACTCTG
TCTAATCCTCGGTCTAGAAGAGAGTACAATGAAGGTCTTCTTGATGATGAAGAAGCTACAGTCATCACTG
ATGTTCTCTGGGATAAGGTTCTGGTGTCTCTGTGTATTGCAAGAAGGTGGTGAGACTGAGATAGTTCT
TCGGGTTGGTGAGGCTCTGCTTAAGGAGAGGTTGCCTAAGTCGTTTAAGCAAGATGTGGTTTTAGTTATG
GCGCTTGCGTTTTCTCGATGTCTCGAGGGATGCTATGGCATTGGATCCACCTGATTTTATAACTGGTTATG
AGTTTGTGAGGAAGCTTTGAAGCTTTTACAGGAGGAAGGAGCAAGTAGCCTTGACCCGATTTACGTGC
ACAAATTGATGAGACTTTGGAAGAGATCACTCCGCGTTATGTCTTGAGCTACTTGCTTACCGCTTGGT
GATGATTACGCTGCGAAAAGACTAAATGGTTTAAGCGGTGTGCGGAATATTTTGTGGTCTGTTGGAGGAG
GTGGAGCATCAGCTCTTGTGGGGGTTTGACCCGTGAGAAGTTTATGAATGAGGCGTTTTTACGAATGAC
AGCTGTGAGCAGGTTGATCTTTTGTAGCTACCCCAAGCAATATTCCAGCAGAGTCATTGAAGTTTAC
GAAGTTGCACCTTGCTCTTGTGGCTCAAGCTTTTATTGGTAAGAAGCCACACCTTTTACAGGATGCTGATA
AGCAATTCCAGCAACTTCAGCAGGCTAAGGTAATGGCTATGGAGATTCTGCGATGTTGTATGATACACG
GAATAATTGGGAGATAGACTTCGGTCTAGAAAGGGGACTCTGTGCACTGCTTATAGGCAAAGTTGATGAA
TGCCGTATGTGGTTGGGCTTAGACAGTGAGGATTACAATATAGGAATCCAGCTATTGTGGAGTTTGT
TGGAGAATTCAAATCGTGATGACAATGATGATCTCCCTGGACTATGCAAATTGTTGGAAACCTGGTTGGC
AGGGGTTGTCTTTCTAGGTTTCAGAGACACCAAAGATAAAAAATTTAAACTCGGGGACTACTATGATGAT
CCTATGGTTTTGAGTTACTTGGAAAGAGTGAGGTAGTTTCAGGGTTCTCTTTAGCTGCTGCTGCAGCTA
TGGCAAGGATTGGAGCCGAGCATGTGAAAGCTAGTGCTATGCAGGCACTGCAGAAAGTTTTCTTCCCG
CTATACAGATAGAACTCGGCTGAACCCAAGGATGTGCAAGAGACAGTGTTTAGTGATAGATCCTGTTGGT
AACAATGTAGGCCGTGATGGTGAGCCTGGTGTCTTTATTGCAGAAGCTGTAAGACCCTCTGAAAACCTTG
AAACTAATGATTATGCAATTCGAGCTGGGGTCTCAGAGAGTAGCGTTGATGAACTACTGTTGAAATGTC
CGTTGCTGATATGTTAAAGGAGGCAAGTGTGAAGATCCTAGCTGCTGGTGTGGCAATTGGACTGATTTCA
CTGTTTCAGCCAGAAGTATTTCTTAAAGCAGCTCATCTTTTCAACGCAAGGATATGGTTTCTTCTATGG
AATCTGATGTGCTACCATAGGGTCAGTCAGAGCTGACGATTCTGCAAGCACTTCCCAGAATGGATGCTAG
GACTGCAGAGAATATAGTATCCAAGTGGCAGAAGATTAAAGTCTCTGGCTTTTGGGCCTGATCACCGCATA
GAAATTTACAGAGGTTTTGGATGGGCGAATGCTGAAGATTGGACTGACAGAGCAGCTGAAACTGCGC
AGCTTGGTTGGTTTATGATTATACACTGTTGAACTATCTGTTGACAGTGTGACAGTCTCAGCAGATGG
AACCCGTGCTCTGGTGGGAAGCAACTCTGGAGGAGTCTGCTTGTCTATCTGATTTGGTTTCATCCAGAAAC
AATGCTACTGATGTGCAACCTACACAACAAGATACGAAGTTTTCTGGTCCAAGTCAGGGTGGAAAATCA
CTGAAGGCTCTGTTCTTGATCATAA

NP_199063.1 (SEQ ID NO:129):

MEALSHVIGLSPFQLCRLPPATTKLRRSHNTSTTICSASKWADRLLSDFNFTSDSSSSSFATATTTATL
VSPPPSIDRPERHVPIPIDFYQVLGAQTHFLTDGIRRAFEARVSKPPQFGFSDDALISRRQILQAACETL
SNPRSRREYNEGLLDDEEATVITDVPWDKVPALCVLQEGGETEIVLRVGEALLKERLPKSFQDVLVLM
ALAFLDVSRDAMALDPPDFITGYEFVEEALKLLQEEGASSLAPDLRAQIDETLEEITPRYVLELLGLPLG
DDYAAKRLNGLSGVRNILWSVGGGGASALVGGLTREKFMNEAFLRMTAAEQVDLFVATPSNIPAESFEVY
EVALALVAQAFIGKKPHLLQDADKQFQQLQAKVMAMEIPAMLYDTRNNWEIDFGLERGLCALLIGKVDE
CRMWLGLDSEDSQYRNPAIVEFVLENSNRDDNDLPLGLCKLLETWLAGVVFPRFRDTKDKKFKLGDYYDD
PMVLSYLERVEVVQGSPLAAAAAMARIGAHEVKASAMQALQKVFPSTRYTDNRSAEPKDVQETVFSVDPVG
NNVGRDGEPPGVFIAEAVRPSNFETNDYAIRAGVSESSVDETTVEMSVADMLKEASVKILAAGVAIGLIS
LFSQKYFLKSSSSQFQKDMVSSMESDVATIGSVRADDSEALPRMDARTAEINIVSKWQKIKSLAFGPDHRI
EMLPEVLDGRMLKIWTDRAAETAQLGLVYDYTELLKLSVDSVTVSADGTRALVEATLEESACLSDLVHPEN
NATDVRTYTRYEVFWSKSGWKITEGSLAS

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FIG. 8 continued 5/40

AY091075.1 (SEQ ID NO:130):

GATTTAACTTATACTACTCAAAATCAAAATTCCATAAACCCCTAGACGACCAAACAGTCTCTTCAATATGT
AAAACAGAACAAAGTTTTTGTAGTAGCCTAAAAAGACACTCCCATGGAAGCTCTGAGTCACGTCGGCATT
GGTCTCTCCCCATTCCAATTATGCCGATTACCACCGGCGACGACAAAGCTCCGACGTAGCCACAACACCT
CTACAACTATCTGCTCCGCCAGCAAAATGGGCCGACCGTCTTCTCTCCGACTTCAATTTACCTCCGATTCT
CTCCTCCTCCTCCTTCGCCACCGCCACCACCACCGCCACTCTCGTCTCTCCGCCACCATCTATTGATCGT
CCCGAACGCCACGTCCCCATCCCCATTGATTTCTACCAGGTATTAGGAGCTCAAACACATTTCTTAACCG
ATGGAATCAGAAGAGCATTCTGAAGCTAGGGTTTCGAAACCGCCGCAATTCCGGTTTCAGCGACGACGCTTT
AATCAGCCGGAGACAGATTCTTCAAGCTGCTTGCGAAACTCTGTCTAATCCTCGGTCTAGAAGAGAGTAC
AATGAAGGTCTTCTTGATGATGAAGAAGCTACAGTCATCACTGATGTTCTTGGGATAAGGTTCTGGTG
CTCTCTGTGTATTGCAAGAAGGTGGTGAGACTGAGATAGTTCTTCCGGTTGGTGAGGCTCTGCTTAAGGA
GAGGTTGCCTAAGTCGTTTAAGCAAGATGTGGTTTTAGTTATGGCGCTTGCGTTTCTCGATGCTCGAGG
GATGCTATGGCATTGGATCCACCTGATTTTATAACTGGTTATGAGTTTGTGAGGAAGCTTTGAAGCTTT
TACAGGAGGAAGGAGCAAGTAGCCTTGCAACCGGATTTACGTGCACAAATTGATGAGACTTTGGAAGAGAT
CACTCCGCGTTATGTCTTGAGCTACTTGGCTTACCGCTTGGTGATGATTACGCTGCGAAAAGACTAAAT
GGTTTAAGCGGTGTGCGGAATATTTTGTGGTCTGTTGGAGGAGGTGGAGCATCAGCTCTTGTGGGGGTT
TGACCCGTGAGAAGTTTATGAATGAGGCGTTTTTACGAATGACAGCTGCTGAGCAGGTTGATCTTTTTGT
AGCTACCCCAAGCAATATTCCAGCAGAGTCATTTGAAGTTTACGAAGTTGCACTTGCTCTTGTGGCTCAA
GCTTTTATTGGTAAGAAGCCACACCTTTTACAGGATGCTGATAAGCAATTCCAGCAACTTCAGCAGGCTA
AGGTAATGGCTATGGAGATTCTGCGATGTTGTATGATACACGAATAATTGGGAGATAGACTTCGGTCT
AGAAAGGGGACTCTGTGCACTGCTTATAGGCAAAGTTGATGAATGCCGTATGTGGTTGGGCTTAGACAGT
GAGGATTACAAATATAGGAATCCAGCTATTGTGGAGTTTGTGTTTGGAGAATTCAAATCGTGATGACAATG
ATGATCTCCCTGGACTATGCAAATTGTTGGAAACCTGGTTGGCAGGGGTTGTCTTTCTAGGTTTCAGAGA
CACCAAAGATAAAAAATTTAAACTCGGGGACTACTATGATGATCCTATGGTTTTGAGTTACTTGGAAGA
GTGGAGGTAGTTTCAGGGTTCTCCTTTAGCTGCTGCTGCAGCTATGGCAAGGATTGGAGCCGAGCATGTGA
AAGCTAGTGCTATGCAGGCACTGCAGAAAGTTTTTCCTTCCCGCTATACAGATAGAAACTCGGCTGAACC
CAAGGATGTGCAAGAGACAGTGTTTAGTGATAGATCCTGTTGGTAACAATGTAGGCCGTGATGGTGAGCCT
GGTGCTTTTATTGCAGAAGCTGTAAGACCTCTGAAAACCTTTGAAACTAATGATTATGCAATTCGAGCTG
GGGTCTCAGAGAGTAGCGTTGATGAAACTACTGTTGAAATGTCCGTTGCTGATATGTTAAAGGAGGCAAG
TGTGAAGATCCTAGCTGCTGGTGTGGCAATTGGACTGATTTCACTGTTTCAGCCAGAAGTATTTCTTAAA
AGCAGCTCATCTTTTCAACGCAAGGATATGGTTTTCTTCTATGGAATCTGATGTGCTACCATAGGGTCAG
TCAGAGCTGACGATTGAGAAGCACTTCCAGAAATGGATGCTAGGACTGCAGAGAATATAGTATCCAAGTG
GCAGAAGATTAAGTCTCTGGCTTTTGGGCCTGATACCGCATAGAAATGTTACCAGAGGTTTTGGATGGG
CGAATGCTGAAGATTTGGACTGACAGAGCAGCTGAAACTGCGCAGCTTGGGTTGGTTTATGATTATACAC
TGTTGAAACTATCTGTTGACAGTGTGACAGTCTCAGCAGATGGAACCCGTGCTCTGGTGGAAGCAACTCT
GGAGGAGTCTGCTTGTCTATCTGATTTGGTTCATCCAGAAAACAATGCTACTGATGTGAGAACCTACACA
ACAAGATACGAAGTTTTCTGGTCCAAGTCAGGGTGGAAATCACTGAAGGCTCTGTTCTTGCATCATAAT
ATACTCATATGTAGCATGTCTGAGCTTGCGAGATTCTTTGTTTTGTAAATTCTCTCTAAGTTAGTG
TTTATAATGAACACAAAAAATTAACGTTCAAAAAA

"Replacement Sheet"

FIG. 8 continued 6/40

ACCESSION AAM13895 (SEQ ID NO:131):

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1 mealshvgig lspfqclrlp pattklrrsh ntstticsas kwadrllsdf nftsdsssss
61 fatatattatl vspppsidrp erhvpipidf yqvlgaqthf ltdgirrafe arvskppqfg
121 fsddalisrr qilqaacetyl snprsrreyn egllddeeat vitdvpwdkv pgalcvlqeg
181 geteivlrvg eallkerlpk sfkqdvvlvm alafldvsrd amaldppdfi tgyefveeal
241 kllqeegass lapdlraqid etleeitpry vlellglplg ddyaakrlng lsgvrnilws
301 vggggasalv ggltrekfmn eaflrmtaee qvdlfvatps nipaesfevy evalalvaqa
361 figkkphllq dadkqfqqlq qakvmameip amlydtrnnw eidfglergl calligkvde
421 crmwlgldse dsqyrnpaiv efvlen snrd dnddlpglck lletwlagvv fprfrdtkdk
481 kfkldgydd pmvlsylerv evvqgsplaa aaamarigae hvkasamqal qkvfpsrytd
541 rnsaepkdvq etvfsvdpvg nnvgrdgepg vfiaeavrps enfetndyai ragvsessvd
601 ettvemsvad mlkeasvkil aagvaiglis lfsqkyflks sssfqrkdmv ssmesdvati
661 gsvraddsea lprmdartae niyskwqkik slafgpdhri emlpevldgr mlkiwtdraa
721 etaqlglvyd ytllklsvds vtvsadgtra lveatleesa clsdlvhpen natdvrtytt
781 ryevfwsksg wkitegsvla s
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"Replacement Sheet"

FIG. 8 continued 7/40

GenBank Acc: AI998415 (SEQ Id NO:132):

ATAAACACTAACTTAGAGAGAGAATTTACAAAACAAAGAGAATCTCGCAAGCTCAGACAT
GCTACATATGAGTATATTATGATGCAAGAACAGAGCCTTCAGTGATTTTCCACCCTGACT
TGGACCNGAAAACTTCGTATCTTGTGTGTAGGTTCTGACATCAGTAGCATTGTTTTCTG
GATGAACCAAATCAGATAGACAAGCAGACTCCTCCAGAGTTGCTTCCACCAGAGCACGGG
TTCCATCTGCTGAGACTGTCACTGTCAACAGATAGTTTCAACAGTGTATAATCATAAA
CCAACCCAAGCTGCGCAGTTTCAGCTGCTCTGTGTCAGTCCAAATCTTCAGCATTGCCCCAT
CCAAAACCTCTGGTAACATTTCTATGCGGTGATCAGGCCCAAAGCCAGAGACTTAATCT
TCTGCCACTTGGATACTATATTCTCTGCAGTCCTAGCATCCATTCTGGGAAGTGCTTCTG
AATCGTCAGCTCTGACTGACCCTATGGTAGCGACATCAGNTTCCATAGAAGAAACCATAT
NCTTGCGTTGAAAAGATGAGC

GenBank Acc: AL382914 (SEQ ID NO:133):

CTGGTGTAGCAATTGGACTCATAACTTTAGCTGGTTTGAAGATTTTACCTTCTAAAAATG
GCTCGCCCGTTCTTCACAAAGTGACTGGTTCAGCAATTGCGTCAGATACTATCAATTTAG
GTCCTGTAGGAGATGAAGAATTAGGAGAGCAACTACCAAAAATGAGTGCAATGGTTGCAG
AAGCTCTAGTCCGCAAGTGGCAATATATCACATCCCAAGCTTTTGGACCTGACCATTGCC
TAGGAAGATTGCAAGAGGTGTTGGACGGCCAAATGTTGAAGATATGGACTGATCG

GenBank Acc: AL382915 (SEQ ID NO:134):

CCCAAGCTTTTGGACCTGACCATTGCCTAGGAAGATTGCAAGAGGTGTTGGACGGCGAAA
TGTTGAAGATATGGACTGATCGAGCAGCTGAGATTGCAGAGCTTGGTTGGTCATATGACT
ACAACTTGGAGGATCTCAACATCGACAGTGTGACCATATCACAGAATGGGCGGCGTGCAG
TAGTGGAACAACACTCTCAAAGAGTCTACCCACCTCACTGCTGTTGGTCATCCACAGCATG
CTACTTCCAACAGCAGAACCTACACAACAAGATATGAAATGTCTTTTTCAGATTCAGGGT
GGAAAATTATTGAAGGAGCTGTCCTTGAGTCGTAATTAGGTTTTGTAATATGTAATATAT
GTCAGGTTAGTACACTTCAATATTAACCCCTCGAGCCTATGCCCACTGTCTTGTATGTA
CCTGTTGTTTTGTGCATTTTTCAAGCATTTATGTAGTCAGGCTGTAAATACTTGGAGGGT
ATTTGATCAAATAATTATCCGGTTAAAAAAAAAAAAAAAAAAAAAAAAA

"Replacement Sheet"

FIG. 8 continued 8/40

GenBank Acc: BI268376 (SEQ ID NO:135):

CACGCTTCTCCAAAAACCTAACCGTCTCCATTCTCCGCCGTCTCCGCCACCAGTAAAT
GGGCGGAGCGACTCATTTCCGATTTCCAATTCTCGGCGACACCTCTTCTCTCTCCA
CCACCACCTCCGCCACAGTCACTCTCACTCCTTCTTACCCTCCTCCGATAGAAGCCACG
TGTCACCTCCCTCTCGACCTGTACAAAATCCTCGGCGCCGAAACGCATTTTCTCGGTGATG
GTATTCCGAGAGCTTATGAAGCGAAATTCTCGAAGCCTCCTCAGTATGCTTTCAGTAATG
AAGCTTTGATTAGTCGTCGTCAGATTCTTCAAGCTGCTTGTGAAACCCTAGCTGATCCTG
CTTCTAGAAGAGAGTATAATCAAAGCCTCGTCGACGATGAAGACGAAGATGAGGAATCTT
CCATTCTCACTGAAATCCCTTTGACAAAAGTTCTGGAGCTCTGTGCGTGTTGCAAGAAG
CTGGAGAGACGGAGTTGGTGCTTCGGATTGGAGGGGGTTTACTGAGAGAGAGGTTACCGA
AGATGTTTAAGCAAGATGTTGTGTTGGCTATGGCGCTTGCATATGTTGACGTTTCTAGGG
ATGCTATGGCTTTGTCCCCGCCAGATTTTATTGTTGCTTGTGAGATGCTGGAAAGGGCAT

AW472683 (SEQ ID NO:136):

AGCGTTGTGTGTGTTGCAGGAAGCTGGAGAGACGGAGCTTGTGCTTGAGATTGGGCAGGG
TTTGCTTAGGGAGAGGTTGCCGAAGACGTTTAAGCAGGATGTTGTGTTGGCTATGGCACT
CGCATTGTGACGTGTCAAGGGATGCTTGGCTTGTTACCGGATTTTATTGCGGCTGTG
AGATGCT

BE472035 (SEQ ID NO:137):

GGAAAGCTTCCTTAACAATGGAGGCATTAACACAGCTAAGCTTTGGCATTTGTACTCCAC
GCCTTTTCATCACCATTTCACTAGCCGCCGCCGGTGGAAGAAGCCGCCGAGACTCAATG
CCGTTAACGGAGGAGCTAGTAGTGTTACCGGTGGAACAAGTAGTTTACCTACTAACTTCT
CCGCTAGTAAATGGGCGGATCGTCTTCTCGCCGATTTCCAATTCTTCTTCCACCACCA
CCTCCGACTCATCGGATTTCCAGAATTCAACTTCTACAACCTCCGTTACGACTATTCTCTC
CTCCTGTTGCTCCTTCAGACCACCACATTTCAATGCCTATAGACTTTTATAGAGTGCTTG
GTGCTGAAGCTCACTTCCTCGGTGACGGTATTAGGAGATGCTACGATGCTAGAATTACAA
AGCCTCCGCAGTACGGATACAGTCAGGAAGCATTGATTGGCCGACGGCAGATTCTTCAAG

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FIG. 8 continued 9/40

CTGCTTGTGAAACCCTTGCTGACTCTACCTCTCGTAGAGAGTACAATCAAGGCCTCGCTC
AGCATGAGTTGATACTATTCTAACTCCTGTCCCCTGGGATAAAGTTCCGGGAGCAATGT
GTGTTTTG

BI120337 (SEQ ID NO:138):

GAAGATTTTCATGAATGAGGCCTTCTTACGTATGACAGCAGCTGAGCAGGTTGATCTGTTC
GTCACCACGCCAAGTAATATCCCGGCTCAAAATTTTGAAGTTTATGGAGTGGCACTTGCC
CTTGTTGCCCAAGCTTTCATTGGTAAAAAGCCTCATCTCATCACAGATGCTGATAACCTA
TTCGGACAGCTTCAGCAGATTAAGGTAACAAATCAAGGGAGTCTTGTTCTGTCTTTGGT
TCCATGGAAAACCGTGATATTGACTTTGGGTTGGAGAGGGGCTTTGTTCACTGCTTGTAG
GCCAGCT

AI043508 (SEQ ID NO:139):

GGGAAACGTGCCTTGGTGGAAGCAACTCTTCAAGAATCAGCGCAGTTAACTGACGTTAAC
CAACCTGAGCATAACGATTCTTACAGCAGAACATACACAACAAGGTACGAGATGTTTCAC
TCCAATGCTGGGTGGAAGATCATAGAGGGAGCTGTCCTCCAATCTTAAGCTGCTGGAAAT
CCAGTCTTGAATGTACATATTTTACATCATCTGCACATTATGAATGAAGGATGGTATGT
GTTTTCTGGACAGTGGTATTTGATCATGTTGTGTTTATTTTGGTAACAAGTTTTGATCAT
TATCAAAAAGATCACTCTTGTAAGTTAGTTTTTCCACAATAAATCAACTATTTATATGA
AAGTTTTTATATCAGGACTACTGCCTTTACTTATATAAACTTTGAGAAATTTTTT

AU095068 (SEQ ID NO:140):

TGGTGCTTCTCATTTGGGCTGCTGCTGCTGCTATTGCAAACTTGGTGCTCAAGCTACAG
CTGCACTTGGTACTGTGAAATCAAATGCTATTCAAGCGTTCAACAAGGTTTTNCCATTGA
TAGAACAGTTAGACAGGTCAGCCATGGAAAATACTAAAGATGGCCCTGGGGGATATCTTG
AAAATTTTGACCAGGAAAATGCACCTGCTCATGATTCGAGAAATGCCGCCTTGAAGATTA
TCTCTCTGGCGCACTGTTTGCACTGTTGGCAGTAATTGGGGCCAAATATTTGCCTCGTAA
GAGGCCCCCTTCTGCTATTAGGAGTGAGCATGGATCTGTGGCAGTTGCTAATAGTGTGA
CTCTACTGATGATCCTGCACTAGATGAAGATCCAGTACATATTCCTAGAATGGATGCGAA
GCTGGCAGAAGATATTGTTTCGCAAGTGGCAGAGTATCAAATCTAA

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FIG. 8 continued 10/40

AU183658 (SEQ ID NO:141):

ATCATAAGAAGCGCCAAGAAGGGCTTCAAGGTGCGAGAAACATTTTGTGGAGCGTTGGCA
GAGGAGGTATTGCTACCGTTGGAGGAGGATTTTCTCGTGAAGCCTTCATGAACGAGGCTT
TTTTGAGGATGACATCAATTGAACAGATGGATTTCTTTTCAAAAACACCGAATAGCATTCTC
CTCTGAATGGTTTGAAATTTACAATGTAGCACTTGACATGTCGCTCAAGCAATTATAA
GTAAAAGGCCACAATTCATCATGATGGCGGATGATCTTTTGAACAACCTCCAGAAGTTCC
ACATAGGTC

AU058418 (SEQ ID NO:142):

ATCATAAGAAGCGCCAAGAAGGGCTTCAAGGTGCGAGAAACATTTTGTGGAGCGTTGGCA
GAGGAGGTATTGCTACCGTTGGAGGAGGATTTTCTCGTGAAGCCTTCATGAACGAGGCTT
TTTTGAGGATGACATCAATTGAACAGATGGATTTCTTTTCAAAAACACCGAATAGCATTCTC
CTCTGAATGGTTTGAAATTTACAATGTAGCACTTGACATGTCGCTCAAGCAATTATAA
GTAAAAGGCCACAATTCATCATGATGGCGGATGATCTTTTGAACAACCTCCAGAAGTTCA
ACATAGGTTCTCATTATGCTTATGATAATGAGATGG

BE490117 (SEQ ID NO:143):

CAGTGCTTGCAATTGGAGGGCACTTACTGGAGGACCGCCCGCCCAAGCGGTTCAAGCAGG
ATGTGGTGCTGGCAATGGCGCTCGCTTATGTGGATCTATCAAGGGACGCAATGGCGGCTA
GCCCTCCAGATGTAATCCGCTGCTGTGAGGTGCTTGAAAGGGCTCTCAAGCTTTTGCAGG
AGGATGGGGCAATCAATCTCGCACCTGGTTTGCTCTCACAAATTGATGAAACTCTGGAGG
ATATCACACCTCGTTGTGTTTTGGAGCTTCTTGCCCTTCCTCTTGATGAAAAACATCAGA
ATGAACACCAAGAAGGTCTTCGTGGTGTGAGAAACATTTTGTGGAGTGTGGCAGAGGAG
GTATTGGTACTGTTGGAGGAGGATTTTCGCGTGAAGCCTACATGAATGAAGCCTTCCTGC
AGATGACATCGGCGGAGCAGATGGATTTCTTCTCAAAAACACCGAATAGCATACCGCCTG
AATGGTTTGAAATCTATAGCGTGCACTTGCAAATGTTGCTCAAGCAATTGTAAGTA

BG607272 (SEQ ID NO:144):

ACACCTCGTTGTGTTTTGGAGCTTCTTGCCCTTCCTCTTGATGAAAAGCACCAGAGTAAA
CGCCAAGAAGGTCTTCGTGGTGTGAGAAACATTTTGTGGAGTGTGGTAGAGGAGGTATT

"Replacement Sheet"

FIG. 8 continued 11/40

GCTACTGTTGGAGGAGGATTTTCNCGTGAAGCCTACATGAATGAGGCCTTTTTGCAGATG
ACATCAGCGGAGCAGATGGATTTCTTTTCAAAAACGCCAAATAGCATACCACCTGAATGG
TTTGAAATCTATAGTGTGGCACTCGCAAATGTTGCTCAAGCAATTGTAAGTAAAAGGCCA
NAGCTCATCATGGTGGCAGATGATCTTTTCGAACAGCTCCAGAAGTTCAATATAGGTTCT
CAATATGCTTATGATAATGAATTGGATCTTGTGTTGGAAAGGGCACTTTGCTCATTGC

BI949952 (SEQ ID NO:145):

GCGAGCATGAGTCCGTGGCAGTTGCTAATGTTGTTGACTCAGGTGATGATGACGAACCAG
ATGAGCCCATACAGATTCCTAAAAATGGATGCGAAGCTGGCAGAAGATATTGTTTCGCAAGT
GGCAGAGCATCAAATCCAAGGCCTTGGGATCAGATCATTCTGTTGCATCATTGCAAGAGG
TTCTTGATGGCAACATGCTGAAGGTATGGACGGACCGAGCAGCAGAGATCGAGCGCAAAG
GCTGGTTCTGGGACTACACGCTGTCCAACGTGGCGATCGACAGCATCACCGTCTCCCTGG
ACGGACGGCGGGCGACCGTGGAGGCGACAATTGAGGAGGCGGGTCAGCTCACCGACGCAA
CCGACCCCAGGAACGATGATTTGTACGACACTAAGTACACCACCCGGTACGAGATGGCCT
TCACCGGACCAGGAGGGTGAAGATAACCGAAGGCGCAGTCCTCAAGTCGTCATAGGGCG

AV833644 (SEQ ID NO:146):

GAAACTCTGGNNGNAGATCACCCCTCGTTGTGTTTTAGAGCTTCTTGCCCTTCCTCTTGA
CGAGNAAGCACCAGAGTAAACGCCAAGNAAGGTCTTCGTGGTGTGAGAAACATTTTGTGG
AGTGTGTTAGAGGAGGTATTGCTACTGTTGGTGGAGGATTTTCACGGGAAGCCTACATG
AATGAGGCCTTTTTGCAGATGACATCAGCTGAGCAGATGGATTTCTTTTCAAAAACGCCG
AATAGCATACCACCTGAATGGTTTGAAATCTATAGCGTGGCACTCGCAAATGTTGCTCAA
GCAATTGTAAGTAAAAGGCCAGAGCTCATCATGGTGGCAGATGATCTTTTCGAACAGCTC
CAGAAGTTCAATATCGGTTCTCAATATGCTTATGGTAACGAGATGGATCTTGCGTTGGAA
AGGGCACTTTGCTCATTGCTTGTGGGAGACATTAGCAACTGCAGAACTTGGCTTGCGATT
GATAATGAATCTTCACCACATAGAGACCCGAAAATTGTAGAGTTTATTGTGAACAACTCT
AGCATTGACCACCAGGAGAATGATCTTCTTCAGGCCTGTGTAAGCTTTTGGAGACTTGG
CTTGTCTCAGAGGTTTTCCCTA

AV921157 (SEQ ID NO:147):

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FIG. 8 continued 12/40

TGGCTTCACCTGNAAATCCAGCACTAAGTTTCTCTTATCACCAACCCAAGGATCTCTTCT
AGCCTAGCAATAATCCGAATAGAACACACCGAAAAACAAAGCTCATCGCTGACTAACTGA
CTAACCAAACCTATCTCCGTCTTCCAAACTGACAAGAGCCTAGACTAGACTGCTTATTTAC
ACACCAGAAAAACACGGGAGGAATCAATCAACAAGGTTTACTGCACGCTGAACGCCCTAT
GACGACTTGAGGACTGCGCCTTCGGTTATCTTCCACCCTCCTGGTCCGGTGAAGGCCATC
TCGTACCGGGTGGTGTACTTAGTGTCGTACAAATCATCGTTTCTGGGGTCCGGTTCGTCG
GTGAGCTGACCCGCCTCCTCAATTGTGCGCTCCACGGTCGCCCCCGCTCCGTCCAGGGAG
ACGGTGATGCTGTGATCGCCACGTTGAACAGCGTGTAGTCCCAGAACCAGCCTTTGCGC
TCAATCTCTGCTGCTCGGTCTGTCCATACCTTCAGNATGTTGCCATCAAGAACCTCTTGC
AATGATGCAACAGAATGATCTGATCCCAAGGCCTTGGATTTGATGCTCTGCCACTTGCGA
ACAA

BE917942 (SEQ ID NO:148):

TATGGGTCTGTGGCAGTTGCTGACTCTGTTGATGGTCTGGGAGCAGATGAAGAGCCACTA
GAAATTCCTAGAATGGATGCAAAGTTGGCTGAAGATATTGTTTCGCAAGTGGCAAAGTATC
AAGTCCAAGGCTTTGGGGCCAGAACACACTGTACGGCATTGCAAGAGATCCTCGATGGC
AACATGCTGAAGGTATGGATGGACCGAGCCACAGAGATTGAGCGTCACGGTTGGTTCTGG
GAATACACACTCTCCGACGTGACGATCGACAGTATCACCGTCTCCATGGACGGTCGACGG
GCAACTGTGGAGGCGACGATTGAGGAGATGGGCCAACTTACCGACGTAGCAGACCCAAAG
AACAACGACGCCTACGACACAAAGTACACCGCTCGGTACGAGATGAGCTACTCCAAGTCC
GGAGGGTGGAGGATCACCGAAGGAGCAGTCCTCAAGTCGTAGAACGGTCGTGCAGCAGGA
GTAGGCGAGTAGGGGTTGCTCAACTCCCATTCTTTTTTCTTTTGCACCAAGTGTATGTAAA
TAAACAGTGTGAGCACAGGTTCTTTTCTCTCTCTGGAGAGAGTTTGGTTAGGTTGATTAGT
GATGAGTTCCTGAGGCCGAGAGAATTTGTCATCTAGTTTGTATTGATAGAGAT

BE918523 (SEQ ID NO:149):

GCACGAGGATAGAACAGCTAGACAGATCAGGCAAGGATACCCAGGTGATGATCTTGAGA
AATCTCTTGAAAACTTGCCCAAGAAATGTTGCTGGAGATGCTATCCATGATTCCAAAAA
TGCCGCTTTGAAGATTATCTCTGCTGGTGCACGTGTTGCACTATTTGCAGTAATAGGTCT

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FIG. 8 continued 13/40

GAAGTGCTTGCCTCGTAAGAAGTCACTTCCTGCTCTTAAGAGCGAATATGGGTCTGTGGC
AGTTGCTGACTCTGTTGATGGTCTGGGAGCAGATGAAGAGCCACTAGAAATTCCTAGAAT
GGATGCAAAGTTGGCTGAAGATATTGTTTCGCAAGTGGCAAAGTATCAAGTCCAAGGCTTT
GGGGCCAGAACACACTGTCACGGCATTGCAAGAGATCCTCGATGGCAACATGCTGAAGGT
ATGGATGGACCGAGCCACAGAGATTGAGCGTCACGGTTGGTTCTGGGAATACACACTCTC
CGACGTGACGATCGACAGTATCACCGTCTCCATGGACGGTCGACGGGCAACTGTG

BM498278 (SEQ ID NO:150):

GCCACAGGCCGCCACCGCCTGGCCCCCTCCACCTGCCGCTCCGCCAGCCGCTGGGCCGACC
GCCTCTTCGCCGACTTCCACCTCCTCCCCGCCGCCGCCGACCCGCCAGCCGCGGCCTCCT
CTTCCTCCTCGTCCCCGTTTCGTCCCGATCTTCCCCGAAGCCGCCGACCGCGCCTTGCCCC
TCCCGGTGACTTCTACAAGATTCTTGGTGCGGAGCCACATTTCTTAGGCGATGGCATTC
GGAGGGCGTTTCGAGTCGCGGATAGCTAAGCCACCTCAGTATGGGTACAGCACAGAAGCTC
TTGCTGGGCGACGGCAAATGCTGCAGATTGCCCATGATACTCTCACAAACCAGAGCTCGC
GCACCGAGTACGACCGTGCGCTTTCCGAGGACCGTGATGCGGCACTCACCATGGATGTTG
CCTGGGATAAGGTTCCAGGTGTGCTGCGTGTGCTTCAGGAGGCTGGGGAGGCACAACCTG

BM498757 (SEQ ID NO:151):

AGCAATGTGGGCAAGTGCGACACTATAGATCTCAAACCATTTCAGGTGGTATGCTATTTCGG
TGTTTTAGAGAAGAAATCCATCTGCTCAGCTGATGTCATCTGCAAGAAAGCCTCATTTCAT
GAAGGCCTCACGAGAAAAATCCTCCTCCAACAGTAGCAATACCACCCCTGCCAACACTCCA
CAATATGTTTTTGCACCTTGCAGACCTTCTTGGCGTTTATTTTTATGTTTTTCATCAGT
AGGAAGAGCAAGAAGCTCCAATACACAACGAGGTGTAATCTCCTCCAAAGTTTCATCAAT
CTGTGCAAGCAGTTCAGGTGCAAGATTGCTTGCACCATCCTCCTGCAGGAGCTTCAGTGC
CCTCTCAAGCACCTCACAACAGCAGATTACATCTGGAGGGCTTGCTGCCATAGCATCCCT
TGATATGTCCACATAAGCCAATGCCA

AW331058 (SEQ ID NO:152):

CGCGTCGACGTATAGAGTCTGCATCCATGTTGCCTTGAATGAAGCGTCTGCAAAAAGAAGG
CTCTTTTATCACCAAGTCGTGTCAGGAAGCATTTTGAAAAATATATCAAAATTTCTTTGGCT

"Replacement Sheet"

FIG. 8 continued 14/40

GAGTGATAGGCCTAATTCAAATAGCAAAGGAAGTGATAAACACCCAGCGGTTAATGATAT
TACTGCTGCAGTTTGCAGCAAAAGATGGATATTCAAGAAGCAGAAACACTTGTAACA
GTGGCAAGACATAAAAATCTGAAGCTCTTGCCCTGACTATCAAAGTACATGCTACCTGA
GATTCTTGATGGTTCAATGCTCTCTAAGTGGGAAGACTTAGCGTTATTAGCAAAGGACCA
GTCTTGCTATTGGAGATTTGTGCTGCTAAATCTTAATGTTGTTGAGCCGAGATAATCTT
GGATGAAATAGGTGCTGGTGAGGCAGCAGAAATTGATGCTGTACTTGAGGAAGCGGCTGA
GCTTGTTGACGATTCCCAGCCCAAGAAACCGAGTTATTACAGCACATATGAAGTTCAGTA
CGTATTGAGGAGGCAGAATCATGGATCTTGGAAAATCTCCGAGGCTGCTGTCCGGGACCT
GACGTGATTTCTGCCAACTCGGCAAACGGGCTACACAACCATTGGCGTATAGGCGGC

BE641509 (SEQ ID NO:153):

GTGGTGTCTTTGCTCGTGTTCTTGATACACAAGGGATGAGTATATGAAGGCAGCTTTTT
CTCGAATGACAGCTGCTGAGCAAGTAGCTTTGTTCAAAATACACCCAGTAATATCCCAG
CAGAGAGTTCTGAGGTTTACACAGTTGCGCTTGCTCACATAGCAGAGGGATTTGTTGCAA
AGAAGCCGCAATTGATTCAAGGAAGCTGATTCACTCTTTCTTCAGCTTCAGCGAACAAATG
CCTCATCATCTAGTTTGCTAGTTACTGGTGGTCTACGGCCATTATCAAGTCTGCAGCTTG
ATTTTGCTTTTGAACGAGCCATGTGCAAAGTCTCTAGGAGAACTGGATGGTTGTCGTG
CATGGCTAGGTTTGGATGATACAACTCTCCATATAGAGACCCTGCAGTGAAGTATTTG
TTATAGCTAATTCTTTTGAAGTGAGGAAGGTGATTATTTACCAGGCCTTTGCAAGTTGT
TGGAAGTTGGTTGAGGGAAGCGGTGTTTTTCCCAACCCGTCAACAGAAAAGTGGAGGT
ACAAGTTGAGGGAGTATTTTTTATGATGCAAGGAGAAAAAAGCCGCCGTGAATTTTTTC
GCGGGGGGCGCTATGAAAAATATATTCAACCTTTTTTTGTTGGGGCGTCGTCTACAAAG
AATGATGGAGTGTCAATTGTTGCTTTTGAAGTGACGAAGGGGCGGCGCTCCTCTTAAGGG
ATCGTCCGTGGGGGCGCGCTCCCATATCGCCATCTTCGGGACACCTTGTTTCGTGGGTC
AAATGGTGATGTCTTTTTTACCACGAACGTACATTATTCTTATAATATAAGCGTGCAGC
AGCACTCTCAGCTTCGACGAAACAGCCTAAA

BI437111 (SEQ ID NO:154):

GAGAACGGAAGCTTTAGAAGTGGAGGTTGTCCCAAAATGGATGCTAGGTTGGCGGAAAT

"Replacement Sheet"

FIG. 8 continued 15/40

TATGGTTCGAAGATGGCAAGCAGCTAAAGCTCGAGCACTTGGTTCTGCTCATGATATGGC
GGCTCTTCCTGAGGTGCTGGAGGGCGAGATGCTGAAGAGCTGGACAGACCGTGTTAGTGA
CGTCAAGAGAAATGGTTGGTTTTGGGAATACACTCTCCTTGGTCTTCACATTGATAGTGT
AACAGTAAGTGACGATGGGAGGCGAGCAACTGCGGAAGCCACTTTGCAAGAGGCAGCCCG
CTTGGTGGACCGCAACAACCCTGACCACAATGATTCTTATAGAAGCACTTACACTACGCG
ATATGACCTCCGGCATGGCATAGATGGTTGGCGAATCAATGGAGGAGCTGTGCTGCGTAC
TTGATTCTGAGATTTTCATCTCCGGATCATGTTGACTTGTTAGGCAGATCGACTAGTTGCA
ACCCTTGTCATGCTACGAATGAGTAGTCTTTTTGGATATTTTGATCCATCATGCAGCTTTG

A

"Replacement Sheet"

FIG. 8 continued 16/40

Prochlorococcus marinus sp. MED4 (SEQ ID NO:155):

ttggaacttccattagatcacttttcgtttaataggcgtaagccccctcagcaacatctgaggaaatattaagggct
ttcca
attacgcttgataaaaactcctgatgaaggattcacgtacgaggttttaactcaaaggctcggaattgcttcgcct
tactg
cagatttgcttacagatccagatagtagaagagattacgaaaatttattactaaatggagcatcaggttttagatt
tatct
tccaatagagaggttgcaggattaattctcctttgggaatcgggctcttctaaagaagcctttaaaataacaaga
aaagc
attgcaaccccccaactcctgcattgggttagcagtagagaagctgatcttaccttgtagcggctttaacatc
tagag
atgctgcaatacaagagcaagatcaaagatcttactcaaagtctgcagattttttacaagaaggcatacagcttc
ttcaa
agaatgggcaaac taggggaattacggaaaactcttgaggaggacttagtgctcgttcttccgtatcgaattctt
gattt
gttaagtagagatctaaatgattatgactcgcataaaaaagggtttaagtatgctggaaaatttaataatcaaaag
aggtg
gattagaaggaaaaataaatctgaatataatgatttttctaaatcagcaagaatttgaatctttctttcaacaaa
taaag
ccattcttgactgttcaggatcagatagattttatttttagaattacaaaaagggggttcaagtgaagcaggattt
ttagc
ttttttatctttaacagcaattgggttttgcaagaagaaaacctgcaaaattattcgaagctcgaaaaaatattaaa
aaaac
taaattttatcaggacttgactcaatgccattaataggttgcccttgatttgcttttagcagatgttgagcaatcct
cagca
aggtttttaagtagttccgatgagaagttaagagattgggtgaataattatcctggagaaaaattagaagcaata
tgtat
tttttgtaaaaattgggttagaaaatgatgttttggttggttatagggatattgatttaaaagaaatcgatttaga
ctctt
ggtttgaagatagagaaatccaagaatttattgagcaaatagaaaagaagtcaaatagaactgtgtttaagtctg
ggcct
caaaataaacctatttttcaagcccaagaatctttaaagattcaagtacgggcccctgatttaaatcggataat
tttga
agaaggccgattacctttgcctggaggagtaagagaagatgggtcaagaagtattgaagaaaatatttatacaga
tgaga
ttattaaaaacaaatcaatagaattttataagtagcgaatagaaaaaattgctgaattaaaattgtatttgag
aagcc
ttagagaactacagaatatttaataaatcttcctacctaacatatctgtatgcttttttgattttatttgctttt
ggcct
agggtgttgatttgtaagaaataatctcaaaaaacccgtgcaggaaaaagaaataattgataactcgttatcgat
aaatg
aaaataagaatgtcttttatgaagggtttaaatcaagatgataaaaagaaagttctcgataactcaaaaattattc
tctca
gataatgcagaaaaagttattttttcagggtgaagaaataaaaaactgcttctccctccttagaaaaaatagaaaat
ttaat
taatacatggcttggttaacaaaagtaaatttctagcaggaaaagggtgaaattaatttatcaaagatagttcaaga
tgatt
tgattgatagattaaagaaggaaagagaacttgatattcaaaaagggtatctacaaaaatatcaatgctaatatcg
aaaat
attgtacttttaactcaaacggcatcaagaatatcagtatcagttgacttaaagtattcagaaaaaatattaaaa
ataga
tggggaattgataaatgaaacaactttcactccttttttgaaagttaaataatatttttaggtttctcaaataactc
ctgga
aattagttgactacattagtggtggttag

"Replacement Sheet"

FIG. 8 continued 17/40

PROTEIN (SEQ ID NO:156) :

LELPDHFRLIGVSPSATSEEILRAFQLRLDKTPDEGFTYEVLTORSELLRLTADLLTDPDSRRDYENLLLNGAS
GLDLS
SNREVAGLILLWESGSSKEAFKITRKALQPPQTPALGSSREADLTLLAALTSRDAAIQEQDQRSYSNAADFLQEG
IQLLQ
RMGKLGELRKTLEEDLVSLLPYRILDLLSRDLNDYDSHKKGLSMLNLI IKRGGLEGNKSEYNDFLNQEFESF
FQQIK
PFLTVDQIDLFLELQKRGSSSEAGFLAFLSLTAIGFARRKPAKLFEARKILKKLNLSGLDSMPLIGCLDLLLLADV
EQSSA
RFLSSSDEKL RDWLN NYPGEKLEAICIFCKNWLENDVLVGYRDIDLKEIDLDSWFEDREIQEFIEQIEKKSNTV
FKSGP
QNKPIFQAQESLKDSSTGPD LN SDNFEEGRPLPGGVREDGQEVIEENIYTDEI IKNSIEFYKYAIEKIAELKF
VFGEA
LENYRIFNKSSYLTYLYAFLILFAFGLGVGFVRNNLKKPVQEKEIIDNSLSINENKNVFYEGLNQDDKKKVL DNS
KIILS
DNAEKVIFSGEEIKTASPSLEK IENLINTWLVNKS KFLAGKGEINLSKIVQDDLIDRLKKERELDIQKGIYKNIN
ANIEN
IVLLTQTASRISVSVDLKYSEKILKIDGELINETTFTPFLKV KYILGFSNNSWKLVDYISGV*

"Replacement Sheet"

FIG. 8 continued 18/40

DRAFT *Prochlorococcus marinus* sp. (SEQ ID NO:157):

MRNA

gtggacctgccaatagatcatttccgcttgctgggtgtcagtccttcggcagacagtgaggcgattttgcgggcc
ttgga
gttgaggttgatcgctgccctgaccaaggtttcacccatgaggtcttaattcagcgggcagaattgttgcggt
ttcag
cagatttgctgactgatccgccacggcgtcaggcctatgagactgccttggtggagctcagtcgtgatcatccag
gtgag
accgccggtcttgatgtgtcacctagtagagaggtggcagggctgatcttgctgtttgaagcgaattcttctcat
gaggt
ttttcatctcgctctcagggattgcaac'gccccagtc'ccccgacgctaggtagcgaacgagaagctgacctcgc
tttgt
tggtggcactggcctgtcgggctgcagccgctgaggaacaggaacaacggcgttatgaagcagcagcgtctcttc
tgcat
gacgggatccagttgctgcagcggatgggcaagctctccgaagagtgccacaagcttgagaacgatttagatgcc
cttct
gccctatcgcatctcgcacttattgagtcgggatcttggtgatcaggtttctcaccaggaaggactgcgcctact
tgaca
actttgtgagccagagaggaggtcttgagggaacggcccatcgctgcacctggtggtcttgatcagtcggaat
ttgac
aacttcttcaagcagatcagaaagtttttaactgttcaggaacaggttgatcttttctcgctggcagcaagcc
ggatc
agcagatgcgggtttcctgggtgggttggtctcttgctgctgttggttttgcgctcggaagcctgaacgggtgca
ggaag
ctcggcagcacttagagaggcttcaactggatggatgcgacccgttgccgatgctgggttgcttgacctcttg
tcgga
gatgtgggcccgcgctcaggagcgttttctgcgcagtacagatcctcgagtgaaggactgtcttaacagccaccct
ggcga
tgaattggctgctttttgtgagtactgccgctcttggtgcgaggggacgtgcttcccgggttatagggatgtgga
tgctg
aggccgttgatctagaggcttggtttgctgatcgggatgttcaggcttatgtggagcgcctggaacgcagcga
atcgt
gcttcttcttaggtaaggccttctcaggatcgtctgtgaagcaacccttcccttgggcgcctcttgatcccgat
gggat
tttgccctctctcttggtgggcctgatgttggtcaacctgcagctgatcagagctctgatgagtttgccagcga
tggtg
tggcatggattgatcgtttagcagatctgccacgcccgcgcggccgggtgctgatcggttcggttgctcttgcgg
cctg
attgcagcctttgcaggcttcagtttggttgccaacgtcctcgctacgtcagtttagtacggctgctgatcagcct
caagt
cacagcacctcctacagccacactgcaagaggaggtcctcatgcctcaagtccctgtcagcgtgtggttgagcc
gctta
ctttggagcagccgaatgaggcacagctcaaaggcctgcttcaggcctggctcagcaacaaggcagtcgtgcttg
ccgt
ggcaagagtgatgcactgcctgaggtcgcaagagatccattggtgcagcgcgtggcgcaagagcgtgccagggat
gctgc
tttagctcagaccagaaggttggtggccagcatcagctctgtagaggtgggtgagtcgaacgccgcagcgtattga
gctga
atgccggttgtagcctatcgcatcaacgcgttgatgctgccggcaaggttggtgacaaacgccccaaaaagatc
tctcg
gtgacttacatccttggtcgatcccgatcggtggcgccctgcatgaatacatcagcggcaataa

PROTEIN (SEQ ID NO:158):

"Replacement Sheet"

FIG. 8 continued 19/40

VDLPIDHFRLLGVSADSEAILRALELRDRCPDQGFTHEVLIQRAELLRLSADLLTDPRRQAYETALLELSR
DHPGE
TAGLDVSPSREVAGLILLFEANSSHEVFHLASQGLQPPQSPTLGSEREADLALLLALACRAAAAEQEQRREYAA
ASLLH
DGIQLLQRMGKLSEECHKLENDLDALLPYRILDLLSRDLGDQVSHQEGRLRLDNFVSQRGGLEGTAPSPAPGGLD
QSEFD
NFFKQIRKFLTVQEVDLFLRWQQAGSADAGFLGGLALAAVGFSRRKPERVQEARQHLERLQLDGCPLPMLGCL
DLLLG
DVGRAQERFLRSTDPRVKDCLNSHPGDELAACEYCRSWLRGDVLPGYRDVDAEAVDLEAWFADRDVQAYVERLE
RSEN
ASSLGKAFSGSSVKQFPWPAPLDPDGILPLSLGGPDVGQPAADQSSDEFASDGMWIDRLADLPRPTRPVLIGSV
VFAAL
IAAFAGFSLFGQRPRTSVSTAADQPQVTAPPTATLQEEVLMQVPVSAVVEPLTLEQPNEAQLKGLLQAWLSNKA
VVLG
GKSDALPEVARDPLVQVQERARDAALAQTQKVVASISSVEVVSRTQPRIELNAVVTYRDQRVDAAGKVVDQTP
QKDL
VTYILGRDPDRWRLHEYISGK*

"Replacement Sheet"

FIG. 8 continued 20/40

Synechococcus sp. PCC7002 (SEQ ID NO:159):

GTGCGCATTCCGCTCGACTATTACCGCATCCTATGCGTCCCCGCCAAGGCAACCACTGCCCAAATTACCCAAGCC
TATCGCGATCGCCTCTCCCAATTTCCCGTCGCGAACATAATGCCTTGGCCATTGAGGCCCCGCAACCGGATTATC
GAGCAAGCCTTTGAGGTGTTATCCCAAACAGAAACCCGCGCGTCTACGACCATGAGCTGTCGGGCAATATGTTT
CGTTCCCTCGTCCCCAGCCGTCCGAAACTGCCTTTTCCCGATCGCCCCCTCCAGTGACACAGAGTTAGAAGCCCTG
ACAGCCCACCAACCAACCATTTGACATCGCGGAAAAAGATTTACTGGGGGGGACTGCTGTTACTCCTCGACCTGGGG
GAGTACGAATTAGTGCTGAAGTGGGCTGCCCCCTACCTCAAGGGCAAAGGCAAGCTGGTCAAGGAAGGGAAATTT
GGGGCCGTGAAATCGTCGAGCAAGAACTACGGCTTTGTTTGGCCCTGGCCCACTGGGAATTGAGCCGGGAACAG
TGGCTCCAACAACATTATGAACAGGCGGCTCTCTCCGGTCAGAAGAGTCAAGAGCTATTGGTAGATGTGGCACAA
TTTGACAGACCTCCAACAGGAAATTCAAGGGGATCTCAATCGCCTCAGACCTATCAAGTTCTAGAACTTCTGGCC
CTACCCGAATCAGAAACCAAGAGCGACAACGGGGCTTACAACCTGCTCCAGGAAATGTTGAGTGCTCGCGTGGGG
ATTGATGGCCAGGGGGACGATCAGTCGGGTCTAAGTATTGATGATTTTTTTCGCTTTATCCAGCAGTTACGCAGT
TATCTAACGGTGCAAGAACAGTTGGATCTCTTTGTGGCAGAATCAAAGCGACCTTCGGCGGCAGCGGCCCTACCTA
GCGGTGTATGCTCTCTTGGCTGCTGGGTTTTTCGCAACGGAAACCTGACCTGGTTCGTGCAAGCCAGACCCCTATTA
AAACGCCTCGGCAAACGCCAGGATGTTTTCTTGGAGCAATCAATCTGCGCCTTACTTTTAGGTCAGCCGTCGGAA
GCCAATCAACTGTTAGAACAAAGTCAGGAACAGGAGGCGATCGCCTACATTCAAGAGCAGTCTGAGGGGGCACCG
GATCTACTCCAGGCCTATGTCTCTACGGGGAACAGTGGCTGAAGACAGAGGTTTTTTTCCCATTTCCCGCATCTC
CGGCAACGGCTTGAAGATGGCTCTGTTTCGTTGACGGCTTACTTCGCGGATCCTGAAGTGCAGCAATATCTTGAC
GATCTCCTCACGGAGGCTGTCCCCACACCCACACCATCCAGACACAGAAAGTACAGCGGCCCCGTCGGAAAAAG
CCACCGGAAACATTACAGTCAGAAACCGGTGTTTCGCGCATCCAGTCGTCCCGCCAAGGTTGATTCTTTGAG
GATCTCGTCACTCAAACCTCCGCTACAGTTCCCCCGGCACCGCCTTCTCCTGGTGTAGCACCTGTAACCTGCGGCA
TTAAACCCAGACCCGGAAGCGTCTTCTGCTTCGTCAAATCAGTTTCGTCAAAAAAGTCTATCGGGCCTTGGGGG
GCGATCGCCGCTATCGTGGGGAGTGTTCGCTGGTTCGTGGGCTGGTGCGAATTTTGTCTGGCCTAACTACCCAG
GAACCCCTTACAGGTCACCCCTCAACGGTGAGCCACCCCTAACGATCCCCAGCTTAGACACCGCCGAGGCAAATAAT
AATCCGAGAATGGAGCGACCGATACAACGACAACGCCTGCGCTCAATGAGGCGATCGCCGCTGAGGTGATTCAA
ACTTGGTTTGAGAGTAAAGCTAGAGCCTTTGGCCAAGACCGTGATTTGGCGGCTCTAGAAAATATTTTGGCAGAA
CCGTCCCTGTCCCGCTGGCGCAGTAGTGCCAGGCCGTCCGCGAGCGCTGGTACCTACCGCACCTATGACCACAGT
TTGACCATTTGAAACGGTGAGCTTCAACCCAGACCAACCCAATGTGGCGACCGTTGAGGCCCAGGTGCAGGAAAAAG
GCAGATTATTACCGGGCGAATGGGGAACGCGATCCCGGCCAGTCCTATGATTCTGACCTGCGTGTCCGCTACAGC
TTGGTGCGCCAAGGCGATCGCTGGTTGATTCTTCTTCCCAAACCTGTAA

Protein: (SEQ ID NO:160):

>Scc_7002_Sequence 1 ORF:57453.. 55303 Frame -2

MRIPLDYYRILCVPAKATTAQITQAYRDRLSQFPRREHNALAIERNRIIEQAFEVLSQTETRAVYDHELSGNMF
RSLVPSRPKLPFPDRPSSDTELEALTAHQPTIDIAEKDLLGGLLLLLLDLGEYELVLKWAAPYLKKGKLVKEGKF
GAVEIVEQELRLCLALAHWELSREQWLQQHYEQAALSGQKSQELLVDVAQFADLQQEIQGDLNRLRPYQVLELLA
LPESETQERQRLQLLQEMLSARVGIDQGDDQSGLSIDDFLRFIQQLRSYLTVQEQDLDFVAESKRPSAAAAAYL
AVYALLAAGFSQRKPDLVVQAQTLKRLGKRQDVFLQSIALLLGQPSEANQLLEQSQEQAIAIYIQEQSEGAP
DLLPGLCLYGEQWLKTEVFVSHFRDLRQRLEDGSVSLTAYFADPEVQOYLDLLTEAVPTPTPHPDTESTAAPSEK
PPETLQSETGVSPHPSRPKVDSEFEDLVQTPTATVPPAPPPGVPVTAALNPDPEASSASSKSVSSKKSIGPWG
AIAAIVGSVLLVVGLVIRLSGLTTQEPLQVTLNGEPLTIPSLDTAEANNNPENGATDTTTTTPALNEAIAAEVIQ
TWFESKARAFGQDRDLAALENILAEPSSLRWRSSAQAVRSAGTYRTRYDHSLLTIETVSFNPDPQPNVATVEAQVQEK
ADYYRANGERDPGQSYSDSLRVRYSLVRQGDRLIRSSQTL

"Replacement Sheet"

FIG. 8 continued 21/40

ACCESSION AF421196 (SEQ ID NO:161):

```
1 cttgccgact aaaggctaag catcgccatt ccttagatta aagcagtctg tcggcggcgc
61 tgtgccggtt aacaccagtc tgctcgctgac agcgggtgcct ttctggggct tgccctgtggg
121 gcgagtaacc gatcgctggg ataagagttg gtgcttcttg ctctcaagaa tagggttttc
181 cgtcgcgtat tcccgatcac atccccctgt gtctgctacg gagataacgc cgatcactca
241 acagaattgg taagttgacg gtcaagttgg gatgatgaag tcggctcaag ctggcgatcc
301 ggatctggtg ggtgttctgt gcgtattcct ctcgattact accgaattct ctgtgttggc
361 gtgcaagcct cggcagacaa acttgccgaa agctaccgag atcgcccaa ccaatcgccc
421 tcccatgagt ttccagagct ggcattgcag gcgcggcggc aactcctcga agcagcgatt
481 gctgagctga gtgatccga acagcgcgat cgctacgac gccgcttttt tcaggcggtt
541 ctggaagcga ttgaaccaag cctagaactc gaagactggc agcgaattgg agccctgctg
601 atcctgctgg aattggggga atacgatcgc gtttcgcaac tggctgagga actcctgcc
661 gactacgacg cgagcgcaga agtacgcgat cagttcgcg cgggtgatat cgccttggcg
721 atcgcaactat cccagcaatc cctcggtcga gaatgccgtc agcaggggtc gtacgaacag
781 gccgcccagc actttggccg cagccagtct gccctagccg atcatcagcg ctttcctgaa
841 ctgagtcgaa ccctgcacca agaacaagga cagctacggc cctatcgcat tttggagcgg
901 ttggcccagc ccttgactgc cgatagcgat cgccagcagg gtttgctgtt gttgcaggcg
961 atgttgagc accggcaggg cattgaaggc cctggggatg atggctcggg gctgaccctt
1021 gataactttt tgatgtttct ccagcaaatt cgcggtatc tgaccctggc tgaacagcag
1081 ttgctgtttg aatcggaagc gcgtcggccc tcgcccgtg cgagcttttt tgctgctac
1141 accctgattg cgcggggctt ttgcgatcac caaccctcgt tgatccatcg cgccagctt
1201 ctcttgcatg aactcaagag ccgatggat gtgcacatcg aacaggcgat cgccagccta
1261 ttgctcggac agcccgaaga agctgaggcg ctactcgtcc agagccaaga tgaggaaacc
1321 ctcagccaaa tccgtgccct agcccgaagg gaagccctga tcgtcggttt gtgccgattc
1381 acggaaacct ggctagcgac caaggtattt ccggatttcc gcgacctcaa ggaaaggact
1441 gcgcccgtgc agccctactt tgacgacccc gatgtccaga cctatctgga tgcgatcgtg
1501 gagttgccgt ccgatttgat gccaacgcgg ctaccctgtg agccgcttga ggtgcgatcg
1561 tcgttgctgg ccaaggaact gccgaccca gcaacgcctg gtgtagctcc acccctcgc
1621 cgccgtcgcc gcgatcgtc cgaacgtcct gctcgcacgg ccaaacgctt gcccttgccc
1681 tggattggtt tgggggttgt ggtggttctc ggcgggtgaa caggggtttg ggcttggcga
1741 tcgctgtcca attccacccc gccgacccc ccccccgtgg ttcaaacgct gcctgaggcg
1801 gtacctgccc cttcgcccgc gccagttacc gttgccctcg atcgggctca ggctgaaact
1861 gtgttgcaaa actggttggc cgctaaaagt gcagccttgg ggcctcaata cgatcgcgat
1921 cgcttagcga cgggtgctgac cggtgaggtt ctgcagactt ggcagggttt ttctagccag
1981 caggccaaca cccagctcac atcacagttc gatcacaagt taaccgtcga ctcagttcag
2041 ctcagtgacg gtgatcaacg agcagtagtc caagccaagg tcgatgaagt tgagcaggtc
2101 tatcgaggcg accagctgct cgaaacgcgc cgagatttgg gcttggtgat ccgctaccag
2161 ctcgtgcgcg agaacaacat ctggaaaatt gcttcgatta gtttggtgcg ctagggaattc
2221 gcaaggggtg aaccccctgc ggtcttttct gtagatcccc tagagcgatc gcagaatgtt
2281 cagcgattcc tggatgtgcg cttgggcatt caagagtga tcaaaaatgt ggcgcacctt
2341 gccctctttg tcgatcacat aagtgcgcgc acccggaatc acaaacaggg ttttgggcac
2401 gccataggtt tgacggaggc gatcgccctg atcgctcagc agttggaagg gcaagttgta
2461 tttctgggc
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"Replacement Sheet"

FIG. 8 continued 22/40

AF421196_1 (SEQ ID NO:162):

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1 mripldyryi lcvgvqasad klaesyrdrl nqspshfse lalqarrqll eaaiaelsdp
  61 eqrdrydrf fgggleaiep sleledwqri gallillelg eydrvsqlae ellpdydasa
 121 evrdqfargd ialaialsqq slgrecreqqg lyeqaaghfg rsqsaladhq rfpelsrtlh
 181 qeqgqlrpyr ilerlaqplt adsdrrqgll llqamlddrq giepgddgs gtlldnflmf
 241 lqqirgytl aeqqllfese arrpspaasf facytliarg fcdhqpslih raslllhelk
 301 srmdvhieqa iaslllggpe eaeallvqsq deetlsqira laqgealivg lcrftetwla
 361 tkvfpdfrdl kertaplqpy fddpdvqtyl daivelpsd mptplpvepl evrssllake
 421 lptpatpgva ppprrrrrdr serpartakr lplpwiglcv vvvlgggtgv wawrsrsnst
 481 pptpppvvt lpeavpaps apvtvaldra qaetvlqnwl aakaaalgpq ydrdrlatvl
 541 tgevlqtwgq fssqqantql tsqfdhklv dsvqlsdgdq ravvqakvde veqvyrqdql
 601 letrrdlglv iryqlvrenn iwkiasislv r
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"Replacement Sheet"

FIG. 8 continued 23/40

AP003590 (SEQ ID NO:163):

ATTATGTTGATCACGGTGCAGGGGAAGTACGCTGTGCGAATTCGGCTAGATTACTACCGAATTTTAGGGCTACCG
TTAGCGGCAAGTGATGAACAACCTGCGACAAGCATACAGCGATCGCATTTGTCCAATTGCCGCGACGGGAGTATTCT
CAAGCAGCAATTGCTTCCCGTAAACAACCTTATAGAAGAAGCTTACGTGGTTTTATCAGATCCAAAGGAACGCAGC
AGTTATGACCAGCTGTATCTTGCTCACGCCCTACGACCCAGACAACCGCGGTACAACCAAAGTGGCAGTGAAAAAT
CGTGGGGACAGCAACAATGGTCATTTTCGATGTCCAAAGCCTGAGCATCGAAGTTTCTCCGAGGAATTAATTGGT
GCTTTATTAATTTTGAAGAGTTGGGAGAGTATGAACTCGTACTCAAGTTAGGTCGTAATTACTTAGGTAATCAA
AACGGCACAGCATCCACCAGAAAATGGCAATCATCGCACGCCTGAAGAATTTCTCGATAGTTCTGAACGTCCAGAT
ATTCTCTTGACTGTTGCTTTGGCCTCATTAGAATTAGGGCGGGAACAATGGCAACAAGGCCACTATGAAAACGCT
GCTTTGTCTTTAGAGACTGGGCAAGAAGTGCTGTTTAGTGAAGGCATCTTCCCAGCGTCCAGGCAGAAATTCAG
GCTGATCTTTACAAATTACGCCCTTATAGAATTTTAGAATTACTTGCCTTACCCAGGAAAAACCAATTGAACGC
CACCAAGGGCTGGATCTATTACAAAGCATCTTAGACGATCGCGGTGGCATTGATGGTACAGGCAATGATCAATCA
GGCTTAAACATTGATGACTTCCCTCCGATTTCATCCAGCAATTACGCCACCACTTAACAGTGGCTGAACAACATAAG
TTGTTTGATGGTGAAAGCAAACGCCCTTCGGCTGTGGCTACATACTTAGCTGTTTATGCTTCCATCGCCAGAGGA
TTCACCCCAACGCCAGCCCGCTTTAATTCGTTCATGCCAAGCAAATTCGTATGCGTTTGTCTAAGCGGCAAGATGTG
CATTTAGAGCAGTCCCTGTGTGCGCTATTACTAGGGCAAACCTGAAGAAGCCACGCGAGTTTTAGAACTGAGCCAA
GAATACGAAGCTTTAGCCTTAATTCGAGAAAAATCTCAAGATTCACCCGATTTACTGCCAGGTTTGTGCTTATAT
GCCGAACAATGGCTGCAAAATGAAGTTTCCCCCATTTCCGCGATTTGTCCAGACAGCAAGCTTCCCTGAAAGAT
TACTTTGCTAATCAACAAGTACAAGCGTATTTAGAAGCCTTGCCCAACGACGCGGAAACCACTAATGAATGGGCT
GTAATTAACCGCCAATCGTTTCTCAACCCAGGGGCAATTCTTACTCTGGAGGAACGCCAGTCGCCAAACGTCCC
GTAGGGAAGGCGAACAGGCCAGGAGAAAGCGTCCACAAGACCAGTTCCCCAACGTAGTCATCCATCAGAAGTAAAT
CGGCAGTTTCATCAAAAACAGAACCCCTGATCCCCGAATTACCAGAAAACATCAAAACCACAGAAGACCAGAGTCTTCA
AATTTTACAACCTGCTAGAGAAAAATATATCGACCACAGATGCTTACACTGACAATTATCCACCAGAGATCCCTGTA
GAACGCGCCAGCAGACCTGTTTCAGCCGGGGGTAAAGTGGTTATACCCAATCGACCCCTCCACGGCAAACTCCTAAA
CGCAGGAGACGCAAGAAGCCACAGGCAGTTGTCAACAGAGGACACAGTATTCATCAGCAACGCCAACCCCTCACCT
AGCACTCTAGGCCGGAACCAAGATTACTTTGGATAGTTTGGGTTCTTTGGGTGGGATATTATTGTTCTGGCTG
ATAGTCTCAACGACTTTTGGGTGGTTAAAGAATGTATTCTTCCAGCACCATCTTTACAAGGTGAGCAATTATCG
ATTCGATTAGTCAACCACCTTTAGAGATTCTTGACAAAAATGCCAGATAACAATCCCCAGAGGTGAGTCTCACA
GAAGAAACGGCAAGGAAAAATAATTGAAAAATTGGTTGGCTACCAAGCTAGTGCTTTAGGCGCTGAACATAAAAT
GAGAGTTTAAACGAGATTTTAACTGGTTTCAGCGTTATCTCAATGGCGGCTAATTGCCTTGCAAGATAAAGCAGAC
AATCGTCATCGAGAATACAGTCATAGTGTCAAGGTAGACTCCATCAGTAAATCTGACATAGATCCCAATCGTGCA
AGTGTGGGGGCTACAGTCAGAGAGTTAACCCAATTTTATGAGAATGGGCAAAAAGGGAAGTCTTCTGACGAAAGA
TTACGTGTACGCTATGAATTGATTTCGACAAGATGATATTTGGCGGATTTCAGAGGATGTCAGCCGCTATAAATTAA

BAB74406 (SEQ ID NO:164):

1 mlitvqgkya vripldyyri lglplaasde qlrqaysdri vqlprreysq aaiasrkqli
61 eeayvvlsdp kerssydqly lahaydpdna attkvavenr gdsnnghfdv qslsievsse
121 eligallilq elgeyelvlk lgrnylgnqn gtastrngnh rtpeefldss erpdilltva
181 laslelgreg wqgghyenaa lsletgqevl fsegifpsvq aeiqadlykl rpyrilella
241 lpqektierh qgldllqsil ddrggidgtg ndqsglnidd flrfiqqlrh hltvaeqghkl
301 fdgeskrpsa vatylavyas iargftqrqp alirhakqil mrlskrqdvh leqslcalll
361 gqteeatrvi elsqeyeala lireksqdsp dllpglclya eqwlqnevfp hfrdlrqqqa
421 slkdyfanqq vqaylealpn daettnewav inrqsfsqpr gnsysggtpv akrpvgkanr
481 pgeastrpvp qrshpsevnv qfhqnrtppd elpetsnhrr pessnfttar enisttdayt
541 dnyppeipve rasrpvqpgv sgytqstppr qtpkrrrrkk pqavvnrghs ihqqrqpsps
601 tlgrktrllw ivlgsllgil lfwlvsttf gwlnkvffpa pslqgeqlsi qisqppliep
661 dknaiqispe vslteetark iienwlatka salgaehkie slneiltgsa lsqwrllialq
721 dkadnrhrey shsvkvdsis ksdidpnras vgatvreltq fyengqkgks sderlrvrye
781 lirqddiwri qrmsaain

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"Replacement Sheet"

FIG. 8 continued 24/40

NP_486747 (SEQ ID NO:165):

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1  mlitvqgkya vripdyyri lglplaasde qlrqaysdri vqlprreysq aaiaarkqli
61 eeayvvlmdp kerssydqly lahaydpdna attkvavenr gdsnnghfdv qslsievsse
121 eligallilq elgeyelvlk lgrnylgnqn gtastrngnh rtpeefldss erpdilltva
181 laslelgreg wqqghyena lsletgqevl fsegifpsvq aeiqadlykl rpyrilella
241 lpqektierh qgldllqsil ddrggidgtg ndqsglnidd flrfiqqlrh hltvaeqhkl
301 fdgeskrpsa vatylavyas iargftqrqp alirhakqil mrlskrqdvh leqslcalll
361 gqteeatrvi elsqeyeala lireksqdsp dllpqlclya eqwlqnevfp hfrdlrqqqa
421 slkdyfanqq vqaylealpn daettnewav inrqsfsgpr gnsysggtpv akrpvghanr
481 pgeastrpvp qrshpsevr qfhqnrtppd elpetsnhrr pessnfttar enisttdayt
541 dnyppeipve rasrpvqpgv sgytqstppr qtpkrrrrkk pqavvnrghs ihqqrqpsps
601 tlgrktrllw ivlgslggil lfwlivsttf gwknvffpa pslqgeqlsi qisqppleip
661 dknaqigspe vslteetark iienwlatka salgaehkie slneiltgsa lsqwrllialq
721 dkadnrhrey shsvkvdsis ksdidpnras vgvatvreltq fyengqkgks sderlrvrye
781 lirqddiwri qrmsaain
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"Replacement Sheet"

FIG. 8 continued 25/40

DRAFT Nostoc punctiforme analysis files

Version 31may01 - Contig493 Gene 84 (SEQ ID NO:166):

MRNA

GTGCGAATTCGCTAGATTACTACCGAATTTTAGGACTACCGTTAGCGGCAAGTGAAGAACAATTGCGACAGGCA
TACAG
CGATCGCATTGTACAATTGCCACGACGTGAGTATTCTCAGGCAGCAATTTCTTCTCGTAAACAACATCATAGAAGA
AGCTT
ACGTGGTTTTATCAGATCCAAAACAACGCAGTACCTACGATCAGCTTTATCTTGCCACGCCTATGACCCTGATA
ACCTT
GCTGCTGCCGCAGTAGCACAGGAAAATCGTACAGAAAGCACAAAAGGGGTAGTGATACCCAGAGTCTTGGTATA
GAAAT
TACCCAAGACGAATTAGTTGGCGCTTTATTAATTTTGCAAGAGTTGGGTGAATACGAACCTGTATTGAACTAGG
TCGTC
CGTACCTAGTAAATAAAAAATAGTGCTACAAGTTCAAGAAAAAGCAATAACTTAGCAGATGAAGAAATTTATGAAA
GTGCT
GAACACCCAGATGTCGTTCTCACTGTTGCTCTTGCTGTCTAGAATTAGGTCGGGAACAGTGGCAGCAAGGTCAC
TACGA
AAATGCCGCCATATCCCTAGAACTGGTCAAGAGCTGCTAGTACGTGAAGGTTTGTCTCCAGTATCCAGGCAGA
AATTC
AGGCTGATCTTTACAAATTGCGGCCATATCGAATTTTGGAGTTGCTCGCATTACCTCAAGAAAAGACTGCCGAAC
GAAGC
CAAGGCTTAGAATTATTGCAAAATCTCTTAGAAGATCGTGGCGGGATTGATGGCACGAACAATGATGAATCGGGT
TTAAA
CATAGATGACTTTCTGCGATTTATCCAGCAGTTACGCAACCACTTAACAGTTGCAGAACAGCACAAGTTATTTGA
AGCTC
AAAGCAAACGTTCTTCTGCTGTTGCCACTTACTTAGCTGTTTATGCCTTGATAGCGCGAGGATTTGCTCAACGGC
AACCT
GCTTTAATTCGTCAAGCAAGACAAATGCTCGTGCCTCTGGGCAAGCGCCAAGATGTACATTTAGAACAGTCGCTA
TGTGC
CTTACTTTTGGGGCAAACCTGAAGAAGCAACTCGTGTTTTAGAACTTAGTCAGGAGTACGAAGCTTTAGCTTTTAT
TCGGG
AAAAATCTCAGGACTCTCCAGATTTGTTACCGGGTCTGTGTTTATATGCAGAACAGTGGCTGCAACACGAAGTCT
TTCCC
CATTTTCGAGATTTAGCAAACAGCAAGCTTTCCTAAAAGATTACTTTGCTAACCAACAGGTGCAAGCTTATTTA
GAAGC
ACTGCCAACTGATGCCCAAACAACATAATGAATGGGCTGTAATTAACCCCCAGTATTTCCCCAGGCCAAGGCAA
GAATA
CTCATTTTCATAACAATTCAACTAAAACCTTCAGCGTCATTTAATCACAGCAGAGTACCTAACCCAGATTTGCCAG
AAACA
CCAACAAAAGAAACCTCTGAATATCCAAACTTCTCACCACCTATGTGGAGTTCATCTGGAAGTATAAAATCAGAG
GTTCC
TGCTGCTGAAAGGATGAGCAGAGGTACTAATCAGCATTTGAACGGTTCAGCTAAGAGTGCTGCATCTGGTCATAA
CCAAA
AGCGTAGGCGGAGAAAACCTACTCCATCTGCTAGCCGAGAGCGTATACCAGATAATCGTCCTCATTCTCGTCGTC
CCCGA
AGGCGGCGAACTTTTGCGAACACCATAGAAGGTAAAACACGGCTGGTATGGAGAGTGTTTATTTCTTTGGTGAGC
ATATT
AGTTTTTTTGGGTATTAGCCACAACAACCTTTTGGATGGTTAAAAAATCTGTTTTTCTCAACCTTCTCCGCCTGA
TCTAC
AGTTGTTTGTACAAATAAACCAACCACCGTTACCTATTCCCCGATCCAAATAGAAAAACCAGAATCAGAAGAAGGCC
CTTTA
ACAAATGCAGAGGCAGAAGAAGTTATTCACACTTGGTTATCTACCAAAGCCGCAGCTTTAGGGCCCAATCATGAG
ATTAA

"Replacement Sheet"

FIG. 8 continued 26/40

TAATTTAGAGCAAATTTTAACTGGTTCAGCTTTATCTCAATGGCGACTGATTGCTCAACAGAATAAGTTAGACAA
TCGCT
ACCGCAAGTTCGACCATAGTTTGAAGATAGAATCTGTTGAGAAAATTGGTTTATTTGCAGATCGTGCCGCAGTAG
AAGCT
ACGGTCAAAGAAGTGACGCAGTTATATGAAAATAATCAGTTTAAAAACTCTTCTAACGATAAATTAAGAGTTCGG
TATGA
CTTGATTGAGAACGAGGTAAATGGCGTATTGAGAGTACATCTGTTGTAAATCAATTCACCAGATAA

PROTEIN (SEQ ID NO:167):

VRIPLDYYRILGLPLAASEEQLRQAYSDRIVQLPRREYSQAAISSRKQLIEEAYVVLSDPKQRSTYDQLYLAHAY
DPDNL
AAAAVAQENRTESTKRGSDTQSLGIEITQDELVGALLILQELGEYELVLKLGRPYLVNKN SATSSRKSNLADEE
IYESA
EHPDVVLTVALACLELGREQWQQGHYENAAISLETGQELLVREGLFSSIQAEIQADLYKLRPYRILELLALPQEK
TAERS
QGLELLQNLLIEDRGIDGTNNDESGLNIDDFLRFIQQLRNHLTVAEQHKLF EAQSKRSSAVATYLA VYALIARGF
AQRQP
ALIRQARQMLVRLGKRQDVHLEQSLCALLLGQTEEATRVLELSQEYEALAFIREKSQDSPDLLPGLCLYAEQWLQ
HEVFP
HFRDLANQQAFLKDYFANQQVQAYLEALPTDAQTTNEWAVINPQYFPQAKAKNTHFHNNSTKTSASFNHSRVPNP
DLPET
PTKETSEYPNFSPPMWSSSGSIKSEVPAAERMSRGTNQHNLNGSAKSAASGHNQKRRRRKPTPSASRERIPDNRPH
SRRPR
RRRTFANTIEGKTRLVWRVFISLVSILVFWVLATTTFGWLKNLFFPQPSPPDLQLFVQINQPPLPIPDNRKPES
EEGPL
TNAEAEVVIHTWLSTKAAALGPNHEINNLEQILTGSALSQWRLIAQQNKLDNRYRKFDHSLKIESVEKIGLFADR
AAVEA
TVKEVTQLYENNQFKNSSNDKLRVRYDLIRERGKWRIQSTSVVNQFTR*

"Replacement Sheet"

FIG. 8 continued 27/40

>*Synechocystis* sp. strain PCC6803 D63999:2314780-2316924 (SEQ ID NO:168):
GTGTTTATCCCCCTCGACTTTTATCGTATTTTAGGCATTCTCCCCAGAGTGGTGGGGAA
ACCATTTAGCAGGCCTACCAAGATCGCCTTTTACAATTACCCCGGCGAGAATTTAGTGAC
GCCGCAGTTACTCTCCGCAATCAATTACTGGCGATCGCCTATGAAACCCTGAGGGATCCG
GAAAAACGTCAGGCATACGACCAAGAATGGTGGGGAGCCATGGATGAAGCCCTGGGGGAG
GCCTTACCCCTCACTACCCCGGAGTTGGAATGTAGCCCAGAGCAAGAAATTGGAGCCCTG
TTGATCCTGTTGGATTTGGGGGAATACGAACCTCGTGGTTAAGTATGGTGAGCCAGTACTC
CACGATCCCAACCCTCCGGCGGGAGGCCTGCCCCAGGACTATTTGCTTTTCGGTAATTTTG
GCCCCACTGGGAACCTGAGCCGGGAACGTTGGCAACAACAGCAGTATGAATTTGCCGCCACC
GCCAGTCTTAAGGCCCTAGCTCGGTTGCAACAGGATAATGACTTCCCCGCCTTGGAAGCA
GAAATTCGTCAGGAACCTATACCGTCTGCGACCCTACCGTATCCTCGAATTTTGGCTAAG
GAGGGGCAAGGGGAGGAGCAACGTGAGCAGGGTCTAGCTCTGTTGCAAGCGATGGTGACG
GACCGGGGCGGCATTGAAGGTAAGGGGGAAGATTATTCCGGATTGGGAAATGATGACTTT
CTAAAATTCATCCACCAACTACGCTGTACCTCACAGTGGCCGAGCAAAACGCCCTATTT
TTGCCCGAAAGTCAACGGCCATCTTTAGTAGCAAGCTATTTGGCAGTACATAGTCTGATG
GCTGAGGGGAGTGAAGGAACAGGACCCCATGGCCATTGTGCAAGCAAAATCTTTGATTATA
CAGTTGGAAAATTGTCAAGATTTGGCCCTAGAAAAGGTAATTTGTGAATTATTATTGGGT
CAAACGGAAGTTGTTCTGGCGGCGATCGACCAGGGAGATCCGAAAATAGTAGCTGGCCTC
GAATCTAAGTTAGCGACGGGGGAAGACCCCTTAAGTCTTTTTTATACTTTCACTGAGCAG
TGGCTAGAGGAAGAAATTGTCCCTACTTTAGGGATCTTTCTCCGGAGACCCTTTCCCCC
AAGGCCTATTTCAATAATCCCTCCGTTTACGAGTATCTAGAACAACCTAGAGCCGATTCC
TTCACCACTGACAATTCTTTTGCCTCCCTGCCCCTCCTTAGCACCGCAACGGAATCGGAA
ACTCCCATGGTACATAGTTCCGCCGCCCTTCCCGATCGCCCTTTGACCTCCACCGTTCCC
TCACGACGGGGACGCAGTCCAAGACGTTCCCGAGACGATGTTTTCCCCAGCGCCGACAAT
TCCAGTGGTTTGGCCGTACACACCCTATCTCCGGCGATCGCCTACGACACCCACTCCTTG
GGCACCAACGGTATTGGCGGGGATAGCACTAGCAACGGTTTTTCCAGTAACCTCCGCCCCA
GAATCCACCAGTAAACATAAATCTCCCCGGCGACGCAAAAAACGGGTGACCATCAAGCCG
GTGCGCTTCGGCATTCTTTCTGCTTTGCCTAGCAGGCATTGTGGGGGGGGCAACTGCCCTA
ATTATCAATCGTACTGGCGATCCCCTAGGTGGGTTGCTAGAAGACCCCTAGATGTTTTT
CTGGACCAACCTTCAGAATTTATCCCCGATGAAGCCACGAGCCGGAATTTGATTCTCAGT
CAACCCAACCTTCAATCAGCAAGTGGGTGAGTACAGGCTGGCTTGATAGTAAA
AAGTTAGCCTTTTGCCCAAAACTACGATGTGCGGGCATTGCAGAGTGTGTTTAGCCCCAAT
CTCCTTGCCCAACAACGGGGTCTGGGCCCAACGGGATCAAGCCCAAAAGGTCTATACCAA
TACGAACACAAGTTGCAGATTTTAGCCTATCAAGTTAACCCCAAGACCCCAACCGAGCC
ACCGTTACTGCCCCGGGTAGAAGAAATTAGCCAGCCCTTTACCCTAGGTAATCAACAGCAG
AAGGGCTCCGCCACCAAGATGACTTGACTGTGCGCTATCAGCTAGTACGACACCAAGGG
GTTTGGAATAATTGACCAAATACAAGTGGTAAATGGCCCCCGTTAG

NP_441990 (SEQ ID NO:169):

1	mfipldfyri	lgippqsgge	tieqayqdr1	lqlprrefsd	aavtlrnqll	aiayetlrpd
61	ekrqaydqew	wgamdeatge	alplttpele	cspeqeigal	lilldlgeye	lvvkygepvl
121	hdpnppaggl	pqdyllsvil	ahwelsrerw	qqqqyefaat	aslkalarlq	qndfpaalea
181	eirqelyrlr	pyrilellak	egqgeeqrq	glallqamvq	drggiegkge	dysglnddf
241	lkfihqlrch	ltvaeqnalf	lpesqrpslv	asylavhslm	aegvkeqdp	aiveakslil
301	qlencqdlal	ekvicelllg	qtevvlaaid	qgdpkivagl	eskatgedp	ltafyftfeg
361	wleeeivpyf	rdlspetlsp	kayfnnpvsq	qyleqlepds	fttdnsfasp	allstatese
421	tpmvhssaal	pdrpltstvp	srrgrsprrs	rddvfpsadn	srglavttls	paiaydthsl
481	gtngiggdst	sngfssnsap	estskhkspr	rrkkrvtikp	vrfgillcl	agivggatal
541	iinrtgdplg	glledpldvf	ldqpsefipd	eatsrnlils	qpfnfqvgvq	mvvqgwldsk
601	klaifgqnydv	galqsvlapn	llaqqrgraq	rdqaqkvvhq	yehklqilay	qvnppdpnra
661	tvtarveeis	qpftlgnqqq	kgsatkddlt	vryqlvrhqq	vwkidqiqvv	ngpr

BAA10060 (SEQ ID NO:170):

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FIG. 8 continued 28/40

1 mfipldfyri lgippqsgge tieqayqdr1 lqlprrefsd aavtlrnqll aiayetlr dp
61 ekrqaydqew wgamdealge alplttpele cspeqeigal lilldlgeye lvvkygepvl
121 hdpnppaggl pqdyllsvil ahwelsrerw qqqqyefaas askalarlq qdndfpalea
181 eirgelyrlr pyriellak egggeeqrqq glallqamvq drggiegkge dysglgnddf
241 lkfiqhrlrch ltvaeqnalf lpesqrpslv asylavhslm aegvkeqdpm aiveakslii
301 qlencqdlal ekvicelllg qtevvlaaid qgdpkivagl esklatgedp ltafytfteq
361 wleeeivpyf rdlspetlsp kayfnnpsvq qyleqlepds fttDNSfasp allstatese
421 tpmvhssaal pdrpltstvp srrgrsprs rddvfpsadn ssglavttls paiaydthsl
481 gtngiggdst sngfssnsap estskhksprr rrrkrvtikp vrfgifllcl agivggatal
541 iinrtgdplg glledpldvf ldqpsfipd eatsrnlils qpfnfqvggq mvvggwldsk
601 klafgqnydv galqsvlapn llaqqrgraq rdgaqkvvhq yehklqilay qvnpqdpnra
661 tvtarveeis qpftlgnqqq kgsatkddlt vryqlvrhqq vwkidqiqvv ngpr

AY074283 (SEQ ID NO:171):

MPVAYTFPVLPSCLCGISNRSTSFVVDRLPELQISGLLVVRSE

SGEFFGSGLSLRRFQREGRRRLNAAGGGIHVVDNAPSRTSSSLAASTSTIELPVTCTYQL

IGVSEQAEKDEVVKSVINLKKTDAAEGYTMEAAAAARQDLLMDVRDKLLFESEYAGNLK

EKIAPKSPLRIPWAWLPGALCCLLQEVGQEKLVLDIGRAALRNLDSPYIHDIFLSMAL

AECAIAKAAFEVNKVSQGFALARAQSFLKSKVTLGKLALLTQIEESLEGLAPPCTLD

LLGLPRTPENAEERRRGAIALRELLRQGLSVEASCQIQDWPCFLSQAISRLATEIVD

LLPWDDLAI TRKNKKSLESHNQRVIDFNC FYMVLLGHIAVGFSGKQNETINKAKTIC

ECLIASSEGVLDKFEEAFCSFLLKQGSAAEALQKLESNSDSAVRNSILGKESRSTS

ATPSLEAWLMESVLNFPDTRGCSPSLANFFRAEKKYPENKKMGSPSIMNHKTNRPL

STTQFVNSSQHLYTAVEQLTPTDLQSPVVS AKNNDTSASMPVQLKRNLGVHKNKIW

DEWLSQSSLI GRVSVVALLGCTVFFSLKLSGIRSGRLQSMPIVSARPHSESDSFLWK

TESGNFRKNLDSVNRNGIVGNIKVLIDMLKMHCGEHPDALYKSSGQSATSLSHSASE

LHKRPM DTEEAELVRQWENVKAEALGPTHQVYSLSEVLDESMLVQWQTLAQTAEAKS

CYWR FVLLHLEVLQAHIFEDGIAGEAAEIEALLEEAAELVDESQPKNAKYYSTYKIRY

ILKKQEDGLWKFCQSDIQIQK"

At3g19180 (SEQ ID NO:172):

1 actgtcaaaa ctcaaaagcc ttgagaccaa atttccgatt ttttctctc tgaagaaatc
61 caacaaattg taccatgatt ccagcttcac tctacttctt ctaggggttcg ttcgttttct
121 ggagctgttg cgcaatgccg gtacgttaca catttccagt tctcccttct tcttgtctgc
181 tttgcggaat ctccaatcgc agcaccagct tcgtcgtaga tcgcccggag cttcagatct
241 caggtctcct cgtcgttcgt tctgaatccg gtgaattctt cggttctggg tta tctttgc
301 ggcggtttca gcgagaagga cggaggaggt tgaatgctgc tgggtggtgg atccatgctg
361 tcgacaatgc gccgtctcgt acttcttctc tcgctgcac tacctctaca atcgaactcc

"Replacement Sheet"

FIG. 8 continued 29/40

421	cggttacgtg	ttaccagctt	atcggagttt	ctgagcaagc	tgagaaagac	gaggtcgtta
481	agtcggttat	aaatttgaaa	aaaactgatg	ctgaagaggg	ttatacaatg	gaagctgctg
541	cagctcgcca	ggatcttctc	atggatgtta	gggataaaact	tctttttgaa	tcagaatatg
601	ctggtaacct	aaaagaaaag	attgctccta	aatctctctc	cagaattccg	tgggcatggg
661	tgcctgggtg	tctatgcctt	cttcaagagg	ttggacaaga	aaaacttggtg	ctggatattg
721	gccgggctgc	tctcaggaac	cttgattcaa	agccatatat	tcatgatata	ttcttatcta
781	tggcacttgc	tgagtgtgca	attgccaaagg	ctgctttcga	ggttaacaag	gtctctcaag
841	gatttgaaagc	tcttgctcgt	gctcaaagtt	ttctgaagag	taaagttact	cttgggaaac
901	ttgcattgtt	aactcagatt	gaggagtcac	tagaggggct	tgcaccacct	tgcacattgg
961	atctactggg	cctgccacgc	acgccagaaa	atgcagagag	gaggcgagggt	gcaattgccg
1021	cgctacgcga	actgctcaga	cagggcctta	gtgttgaagc	ttcatgtcaa	attcaagact
1081	ggccatgctt	tttgagccag	gcaattagca	ggttattggc	cacagagatt	gtcgatcttc
1141	ttccatggga	tgatttagcc	attacacgga	aaaataaaaa	atcactggaa	tcccacaatc
1201	aaagagttgt	tattgatttt	aattgtttct	acatgggtgtt	acttggtcac	atcgctgttg
1261	gatttttcagg	caagcaaaat	gaaacgatta	ataaagcaaa	aacgatatgc	gaatgtctca
1321	taggcattcga	aggtggtgat	ctgaaatttg	aggaagcttt	ttgctcattt	cttctaaaac
1381	agggttccga	ggcagaggcc	ctggaaaaac	ttaagcagct	ggaatcaaat	tcagactctg
1441	ccgttcgtaa	ttcgatcttg	gggaaagagt	cgagaagtac	ttctgctact	ccctcactgg
1501	aagcgtggct	aatggagtcc	gtgcttgcta	actttccaga	cacaaggggt	tgttctccat
1561	ctttggccaa	ttttttccgg	gctgaaaaga	aatatccaga	aaacaagaaa	atggggtcac
1621	cttcgatcat	gaatcataag	acgaaccaa	gaccactttc	cacaacacag	ttcgtgaact
1681	cgtcacaaca	tctttataca	gctgtcgagc	agttgacacc	aacagatttg	cagagcccag
1741	tggatatcagc	caagaataat	gatgaaacca	gtgccagtat	gccatctggt	caactgaaga
1801	ggaaccttgg	tgtacacaaa	aataaaatat	gggatgagtg	gctctctcaa	agcagtttga
1861	tcggaagggt	atctgttggt	gctttactgg	gttgccaccgt	gttcttctct	ctgaagctat
1921	caggcattag	gtctggtaga	ctacagagta	tgcctatatc	ggtttctgct	aggccgcatt
1981	cagaatcaga	ttcttttctg	tggaaaacag	agtctgggaa	tttcagaaaa	aaccttgatt
2041	ctgtgaatag	aaatggatatc	gtgggaaaca	tcaaagtgtc	cattgacatg	ttaaagatgc
2101	attgtggcga	acatccggat	gccctgtatc	tgaaaagctc	tggatcaatc	gctacatcat
2161	tgtctcattc	tgcgtcagaa	ctgcataaga	gaccaatgga	tacagaagaa	gcggaagagc
2221	ttgtgagaca	gtgggaaaat	gttaaggctg	aagctcttgg	accaacacat	caagtttata
2281	gcctttccga	agtccttgat	gaatccatgc	ttgtccagtg	gcaaacattg	gcacaaacag
2341	cagaggcgaa	atcctgttat	tggaggttcg	ttctgcttca	tcttgagggt	ttgcaagcac
2401	atatattcga	agatgggtatt	gctgggtgagg	ctgcagaaat	cgaagctctt	ctggaggaag
2461	cagcagaatt	agttgatgaa	tctcagccca	aaaacgcaaa	atattatagc	acttacaaga
2521	tccgatatat	tctgaagaag	caagaagatg	gattgtggaa	attctgccaa	agcgatatct
2581	aaatacagaa	gtgaaaatcc	cccagaaaaa	aaagctcatc	atctaactaa	aggttgtagc
2641	atcaacagta	gaacatggga	tcatttagct	aacggttggt	cttgtttacc	taacgggtgta
2701	ggaaagtctc	aggtttggtt	ctttattcct	tagtaacca	caggatttgt	ctttgtagat
2761	tcttttgatt	tcaatgtgtt	tatggataaa	caaacttctt	gagtattttt	tttattatta
2821	ttgtaaagcg	ttactgatca	caaaaaaaaa	aaaaaaa		

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"Replacement Sheet"

FIG. 8 continued 30/40

AAL66980 (SEQ ID NO:173):

```
1 mpvaytfpvl pssc1l1cgis nrstsfvvdv pelqisgllv vrsesgeffg sgls1rrfqr
61 egrrrlnaag ggihvvdnap srtsslaast stielptvcy qligvseqae kdevvksvin
121 lkktdaeegy tmeaaaaarqd llmdvrckll feseyagnlk ekiapksplr ipwawlpgal
181 cllqevggek lvldigraal rnldskpyih diflsmalae caiakaafev nkvsqgfeal
241 aragsflksk vtlgklallt qieeslegla ppctldllgl prtpeaerr rgaiiaalrel
301 lrqglsveas cqi1dwpcfl sqaisrllat eivdllpwdd laitrknkks leshnqrvvi
361 dfncfymvll ghiavgfsgk qnetinkakt icecliaseg vdlkfeeafc sfl1kqgsea
421 ealeklkqle snsdsavrn1 ilgkesrst1 atpsleawlm esvlanfpdt rgcspslanf
481 fraekkypen kkmgspsimn hkt1qrplst tqfvnssqhl ytaveqltpt dlqspvvsak
541 nndetsasmp svqlkrnlgv hknkiwdewl sqssligrvs vvallgctvf fslklsgirs
601 grlqsmplsv sarphsesds flwktesgnf rknldsvnrn givgnikvli dmlkmh1cgeh
661 pdaly1kssg qsatslshsa selhkrpmdt eeaeelvrqw envkaealgp thqvyslsev
721 ldesmlvqwq tlaqtaeaks cywrfvllhl evlqahifed giageaaeie alleeaaelv
781 desqpknaky ystykiryl kkqedglw1f cqsdiqiqk
```

"Replacement Sheet"

FIG. 8 continued 31/40

Second Set

BJ258222 (SEQ ID NO:174):

GGCCGTCGGCAAATACTGCAGNTTGCACATGATACTCTCACAAACCAGAGCTCCCGCACC
GAGTATGACCGCGCGCTCTCTGAGGACCGTGACGCGGCGCTCACACTGGATGTTGCTTGG
GACAAGGTTCCGGGTGTGCTATGTGCCCTTCAGGAGGCTGGGGAGGCACAGGCAGTGC'TT
GCAATTGGAGAGCAC'TTACTGGAGGACCGCCCGCCCAAGCGGTTCAAGCAGGATGTGGTG
CTGGCAATGGCGCTCGCTTATGTGGACATATCAAGGGATGCAATGGCGGCTAGCCCTCCA
GATGTAATCCGCTGCTGTGAGGTGCTTGAAAGGGCTCTCAAGCTCTTGCAGGAGGATGGG
GCAATCAACCTTGCACCTGGTCTGCTTTCACAAATTGATGAAACTCTGGAGGAGATCACA
CCTCGTTGTGTTTTGGAGCTTCTTGCCCTTNC'TTGTATGAAAAACATCANATTGAACGC
CANNAANGNNT

BQ410206 (SEQ ID NO:175):

AATTGCAGAAGGCATTGTTTCGCAAGTGGCAGAACATTAAATCTGAGGCGTTTGGACCTGA
TCACCGCCTTGATAAATTGCCAGAGGTTCTGGATGGTCAAATGTTGAAGACATGGACAGA
TCGTGCAGCCGAAATCGCTCAGCTTGGTTGGGTATATGAATATAGTCTACTGAACATGGC
CATTGACAGTGTTACCCTTTCACTAGATGGCCAGCGAGCTGTAGTCGAAGCTACTCTGGA
AGAATCCACCTGCTTGACTGATGTTTCATCATCCGGAGAACAATGCCTCTAATGTAAACTC
CTACACCACGAGATATGAGATGTCTTGTTCCAACTCAGGCTGGAAAATCACTGAAGGATC
TGTCTACAAATCTTAACTATGATGTATAAAGCATAAAAAGCCTGAAAGCTCCAATGTGGT
TACCAGCTTTGCCTTTTTTACGTAGCTATATTTGTTATATTGTTTGAGAAAACAAGAGTTA
GCGTTTTCCAGTCATGCAAGCAGTTCAAATTAAAAGAGGCAATGCTTNTCATGGANAACN
AAATG

"Replacement Sheet"

FIG. 8 continued 32/40

AJ485537 (SEQ ID NO:176):

GATGAGCCCATACAGATTCCCTAAATGGATGCGAAGCTGGCAGAAGATATTGTTTCGCAAG
TGGCAGAGCATCAAATCCAAGGCCTTGGGATCAGATCATTCTGTTGCATCATTGCAAGAG
GTTCTTGATGGCAACATGCTGAAGGTATGGACAGACCGAGCAGCAGAGATTGAGCGCAAA
GGCTGGTTCTGGGACTACACGCTGTTCAACGTGGCGATCGACAGCATCACCGTCTCCCTG
GACGGACGGCGGGCGACCGTGGAGGCGACAATTGAGGAGGCGGGTCAGCTCACCGACGCA
ACCGACCCAGGAACGATGATTTGTACGACACTAAGTACACCACCCGGTACGAGATGGCC
TTCACCGGACCAGGAGGGTGGGAAGATAACCGAAGGCGCAGTCCTCAAGTCGTCATAGGGC

BJ263824 (SEQ ID NO:177):

CTGCAAATCTAGCACTATGTTTCTCTTTATCTCCAGGATCTAGCCTAGCACCAACAATCC
AAATACAACACAAGAAAAATAAGCTCTTCGTGATCACATCAGACTAACGCAACTATCG
GTCTTCCAACTAAAAAGGCCTAGACTGCCTGCTTATTTACACACCCCCAAAAGAAAAC
TGGAAGGAATTAACAAACTTAATGAGGTTACCGCACACCAACTACCCTAAGACGACTTGA
GGACCGCGCCTTCCATTATCTTCCACCCTCCTAGTCCGGTGAAGGTCATCTCATACCGGG
TGGTGTACTTCGTGTCGTACGAGTCGTTGTTCTTGGGGTCGGTTGCGTCGATGAGCTGGC
CTGCCTCCTCGATCGTTGCCTCCACGGTCGCCCCCGTCCGTCCAGGGAGACCGTGATGC
TGTCGATCGCCACGTCAGACAGTGTGTAGTCCCAGAACCAGCCTTTGCGCCCGATCTCCG
CTGCTCGGTCCGTCCATACCTTCAGCATGTTGCCATCAAGAACCTCTTGCAATGATTCCA
CAGAATGATCTGATCCCAAGGCCTTGGTTTTGATACTCTGCCACTTGCGAACAATATCTT
CTGCCA

BQ410207 (SEQ ID NO:178):

TTTAACTGCCTCTTTTAATTTGAA
CTGCTTGCTGACTGGAAAACCCTAACTCTTGTTTTCTCAAACAATTTAACAAATATAGC
TCCCTAAAAAGGCAAGCTGGTAACCACATTGGAGCTTTTTCAGGCTTTTATGCTTTATAC
ATCATAGTTAAATTTGTAGACAGATCCTTCAGTGATTTTCCAACCTGAGTTGGAACAAA
ACATCTCATATTTTCGTGGGGTAGGAGTTTACATTACAGGCATTGTTCTCCGGATGATGAA
CATTACTCAAGCCGGGGGGTTCTTCCAAAATAACTTCGACTACAGCTCGCTGGCCATTTA

"Replacement Sheet"

FIG. 8 continued 34/40

TCCCAGAACCAGCCTTTGCGCTCGATCTCTGCTGCTCGGTCCCTCCATACCTTCAGCATG
TTGCCATCA

BJ482132 (SEQ ID NO:182):

GCGAGNAAGGACGAGNATCGTCAAGTCGGCCATCGAGCTGAGGAAATCGGAGATCGAAGA
TGGGTACACGGAGGAGGTGTCCACCTGCAGACAGGCTCTGCTGCTGGACGTGAGAGACAA
GCTTCTCTTTGAACAGGAGTACGCAGGAAGCACCAGGGCCAAGGTTCCGCCCAGATCCTC
TCTTCATATACCCTGGAGCTGGTTGCCTGCTGCCTTGTGTGTCTTGCAGGAGGTTGGGGA
AGAGAAGCTGGTCTTGGACATTGGTCAGGCAGCTCTACGACGCCCTGATTCTAAGCCATA
TGCTCACGATGTACTTCTTGCAATGGCACTAGCTGAATGCTCCATTGCAAAGCTAGCTT
TGAAAAAAGTAAAGTATCTCTTGGCTTTGAGGCTCTAGCACGTGCTCAATATCTTTTGAG
GAAAAAACCATCTTTAGAGAAGATGCCTCTTCTTGAAGCAGATCGAAGAATCACTTGAAGA
GCTTGCACCAGCTTGCACCTCTAGAGGTTTAAAGCCTGCCCCGTACACCTGAAAATTCTGA
ACGCAGGCGTGGTGCTATTGCAGCTCTCTGTGA

BQ490457 (SEQ ID NO:183):

GCATAACACGGCAAGAAGATGTTGCAGTTAATGGCTTTGGAAATGAGGATGTTACAATGG
AGCTTGGCCGTGATAACACTTTAGATTATGTGAATTTAGCCAGTTCAAATTTTACTGAAG
ATAATATCGAGCAAGAATCGGTTACTGAGAAGATAAAAGATTTAGGTGTGAAGGTTATGT
GTGCCGGTGTGGTGATTGGACTGACAACCTTTGGCTGGCATGAAACTTTTGCCTGGCAGAA
GTGGGTCTGCCATTCCACACAGGCATCTTGGTTCTGCTGTGGCTTCTGATGTCTCCAGTG
TGGGGCTCTCAGTAAATGAACTACTGAGGAGAAAGTACCAAAAATGGATGCAAGACTTG
CAGAAGTTCTAGTTAGAAGATGGCAGAACGTTAAATCACA

BU046755 (SEQ ID NO:184):

1 gcagttgcaa ttgctggggg ngattcacta cgtgaaaatt tcatgaacga ggccttcttg
61 catatgactg cagctgagca ggttgattta tttgtagcta cccccagtaa tatcccgga
121 gaaagctttg aagtttatgg ggtggctctt gcgcttggtg ctcaagcctt tgttggtaaa
181 aaacctcatc acattcaaga tgctgaaaac ctattccaga aacttcagca gtctaaggta
241 acagctgtag gacattctct tgacaactat ataaccaaag aaagcagtga gatagacttt
301 gctttggaga ggggactctg ttcacttctt ctaggggacc ttgatgacag tcgttcgtgg
361 ttgggcctag acagtaatga ttcaccatat agaaatccat ctggtgtaga ctttgtcttg
421 gagaactcaa aggatgacga tgacaatgac aatgacaatg atcttcctgg actttgcaag
481 ctattggaga cgtgggtgat ggaggtggta ttccccaggt ttagagacac caaagacata
541 gagttcagac tgggagacta ctatgatgat cctacagtct tgagatactt agaaaggctg
601 gatggcacta atggttcacc cttagctgct g

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"Replacement Sheet"

FIG. 8 continued 35/40

BU035730 (SEQ ID NO:185):

```
1  cagaaagagg tggctggatt gatgactttg gctggccttga aatttatacc gtcttaaaca
61 ggctctacta gtactactgc tcgtaaagaa gttgattcgg ctctggcttc agacgtcacc
121 aatgtggagg attctagggt tgaggatgct gaagacattc ctaaaatgga tgcaagatta
181 gccgaagggtc tagttcgtaa gtggcagagc ataaaatccc aagcccttgg acctgagcat
241 tgccactcaa aattatcata ggtattagat ggtgaaatgc acaagatctg gcttcaacgg
301 gcaaccgaaa ttgctcaacg tggttggttt tgggactaca cgcttttaaa cattaccatt
361 gacagtgtta ccgtttcact cgatgggccc ttagctgttg tggaagcaac cttgaagag
421 tctgccaaagt tgattgattt gacccacccg gaaaacaatg actcctataa tttaacttac
481 accacacgtt atgagatgtc gtgtgccaaag tcatcatgga aaatcacaaa gggggctgtc
541 ctcaaactcat aacagatgta attctttctc accttttctg tatttatctg ttattagatt
601 actcagcagt tgaatgatat gtttctccac catttcgatc atgagcg
```

BQ977057 (SEQ ID NO:186):

```
1  tgtggtgggtt ggattgatga ctttggctgg cttgaaattt acaccgtcca aaagaggctc
61 tactagtact actgctcgta aagaagttga ttcggctctg gcttcagacg tcaccaatag
121 gattctagggt ttgaggatgc tgaagacatt cctaaaatgg atgcaagatt agccgagggt
181 ctagttcgta agtggcagag cataaaatcc caagcccttg gacctgagca ttgccactca
241 aaattatcag aggtattaga tggtgaaatg cacaagatct ggcttcaacg ggcaaccgaa
301 attgctcaac gtggttgggtt ttgggactac acgcttttaa acattaccat tgacagtgtt
361 accgtctcac tcgatgggcg cttagctgtt gtggaagcaa cccttgaaga gtctgccaa
421 ttgattgatt tgacccaccc ggaaaacaat gactcctata atttaactta caccacacgt
481 tatgagatgt cgtgtgccaa gtcttcatgg aaaatcacaa agggggctgt cctcaaacta
541 taacagatgt aattctttct caccttttct gtatttaact gttattagat tactcagcag
601 ttgaatgata tgtttctcca ccatatcgat catgagtgtt tttggtgctg cc
```

BU889000 (SEQ ID NO:187):

```
1  gactgaaaaa ataaaagatg ccagtatcaa aatatgtgtg ctggtgtggc aattggactg
61 ctgacttttag ctggcctgaa gtgttttctt cctaggactg gctccttcac tcgacagaaa
121 gaaattgggtt cggcaatggc atctgacacc atcaatttga attcagcagt agatgaacaa
181 atttccgagg acttaccagc aatggatgca aggggtgcag aggatatagt tcgcaagtgg
241 caaaacatta aatctcaggc ttttggaact gatcactgcc tggcaaaatt gccagagggt
301 ttggatagtc agatgttgaa aatatggaca gatcgtgcgg ccgaaattgc acatcttgg
361 tgggtatagc agtatatgct gttggacctg actattgaca gtgtgactgt atctgtagat
421 ggcctaaatg ctgtagtaga agcaacactc aaagagtcaa
```

"Replacement Sheet"

FIG. 8 continued 36/40

>genie.294.6|Genomic (SEQ ID NO:188):
ATGAACTCGGCGGAGCACGTCTCTGTTGCCGTGGACTATTACCGAATGCTGCACGTTCCCCGCGTAAGCC
GCCCTGACGCCATTTCGCAAGGCGTATGAGAACCTGGTGAAGCAACCCCCCGCTGCCGCGTACTCTGCGGA
CACCTCTTTCGCACGCGCGGTGCTACTCAAGGCAGCCGCGGAGTCGCTGACCGACCCGGACCTGCGCCGC
TCATATGACGCCAAGCTGGCCGCTGGTCACACAGCCCTGCGCGTCAGCCAGCAGGACCTACCCGGAGCCC
TTGTCTGTGCTGCAGGAGGTGAGCCGTGCTCTGGCGACCGCTCAACCCCTTGCGACCGCTAAACCATCAG
CACATATAGCACATATAAATTCCCATGGGTTCTGTACTACCGCCACCCCTCTGAAGGGGGCGAGTATTC
ATTCTTCACGCATGAGCGCAGACTTTTACCCATCAAGTCCCGCCCTCGCCCGCCTTCTCTTCCCACAGA
TCGGCGAGCACCAGTTGGTTCTGGATCTGGGTCTGCGCTGGCTAGAGGTAAACGGCGGCCAGCCCGACGC
CGGCGACGTGGCCGCTGCCGTGGCCCTGGCTACTGTGACCGCGCTGGTGAGCGCCTCACCTCCCAGCTG
CAGCCGCGCGCCCTCAGCGCTGCCAGGCCCGATGGCGCGCGGTGCCGCACGCGCAGCTGGGCGCGG
TGCTGCCCGCATGCGACGACCTGGACGCGAGCTGAGCAAGCTCCGCGCGTACGGCATGGCGCAGCAGCT
GCAGCAGCAGATCGTGGGCGCGCTGCCGGTGAGGCTGGAGCAGGGGCTGGACCGGCAACCGGTCATAGAT
GTAGACACAGGGATGTAGGCGTCGATGCGAGGGGATGGAAGTATGGGGTCTGTGAGTGTGAGCCGATAGG
AAGGTATAGATGCTGGGAGCTGGCGCACCCGACCCATGTCATCCAAGGACTTGGCTGATGCATCGCTCAC
CCCCCGCCTCCAACCCGAATGCCCTCAGGACCTGGCGCCAGAGTACGCGTGCGAGCTGGCCGCCCTGCCG
CTGGGCGCCGAGACCGCCGCCCGCGCGCAAGGGCGTGGCGCTCATGCGCGGTGTGCTGCGCGCCGCCG
CCACCGTGGCCGCCGCCACAGCCAAGTAGGTGACAAGCACGAGGAAATCGTGTGCTATATTGCATTGCG
GTACCTTGCTTGCATCGCGGAGGCAGTGCTCGAGAATGCGTTTCGTGCGCGTGATCCGTTTGCTCGTCG
TGCCTTATCCGCCACCCAGGCCGAGGCTGCTGCTGACGACAGCGACGACGAGGTGGACCCGCGCA
GTGTGCTGGCGGCCGCCGCCGCGCATGCTGACCCGACGCGCGACGTGCTCACCTGCAGCGAGCAGGTACA
GCGCTGCAACCGGCGAGTTATAGATGGATGCAAGTGCGTGACGCCGAACGTACAGTTTGTGCTGTGTTTC
CCGCGTGACACCTTAGCCGCTCCTCCTGCAACCCCTCACTTGCGACCTCAATGCGTGACACCTTAGCCGCTC
CTCCTGCAACCCCTCAGTTGCGACCTCACGACACACCGTCTGGCTTACCCCTGCCCCCAGCCAGGTGGCC
CTGCTGCCGGACGCGCTGCGCGGCAGCGGTGTGTGCGCCACCCCGACGCGCTGTACGACGGCGCCCTGG
CGCACCTGGTGACGGCTTCCGCAACGGCTGGCCGCACTCCGTGCACACAGGTGGGGGAGCGCGGTGCCTG
GATGTCTGGATGGTCACTGGCCGCAAGGCTGTGCGCACCATCGGGTAGAGTGTAACCAAATGATGTGCGC
GCAATGAAGGGTGAGCAGATTCCAGCCTCCCTCTGTGCGCTGGCGTCCAAGTGTGCCAACTGCGCACACA
CCTGCGCACGCCCCAGCCGACGCTGCTGGCCAAGCTGGAGGCGCAGCAGGCCCGCGCAGCCGCTATG
CGCGCGAGCAGTCCGAGCTGGCCGCGCGCGCGCGCAGCCCGCGCTGCCATGTACAGCGGTCCCAGCGCGG
CCCACGCTCCACCCCTGTACACCAACTACAACAACCTGCCGCGCAGCGGCAATggcgcgccgcccgcgc
gccccgcgcgcATGCCCATGGTGCCAGGGGCGACGGCCAGCACGCCATGGCGGCGTCTGTGGCGGCGCAT
GTGCACTCCACGGCGATGGCGGAGCagcgcgccgagcgcgccgctggcgcgccgcccgcgcgcTCCGATG
GCGGCGCGCACGCCAACGGCGTGGCTCTAGAGCGGGCCGTGTGCGCGCTCCTGCTGGGTGACTACCCGC
GGCGGTGGAGCGGCTGGGGCTAGACACGAACGCGCGGTGGAGCAGGAGCAGCTGCGCGAGTTCGTCTCTG
GTGCGCCGGGGAGGGCTACTGCAAAACGTGTTGCTCAGGGTCTTGAGATACCGAACACAATGTTTTCGT
ATACATCTCCCGTCGAGAGAGCTATGCCTCCACCGTCGCGCCGCTCCACTGCACCCGATGCGGTTGCAG
GCCACTCGCCCAACGGCCGCGCGGACCTGCGCCCCGGGCTGAGGGCGCTGGCCACCCGCTGGCTGGAGG
GCGTGGCGCTGGCGTCTTCCGCGACACTGCCGGCAGCCCCGTGCCGCGCTGGAGGCCAGCTGGTTTCGC
GGACCTGCGTGTGCGCTTCTATCTGCAGGTGAGGGGCGGCGAGAAGAGAGGGGGGAAAGGGAGGCGAGAAG
GCGCTTCCGCGGCTGGCGCAACGGGCCATCCTGGTGGAGCACGGCGCTACATCGCATCTGGTCCACCGTC
TCTGGATGTATAATTCTGTGCACTCTTAACCGGCCGCGCAGGTATGGCGGCTGTGCCGCGTGGAGCAGGTG
CTGGCCGCGCCCACTTCTGGCCAACCTGCTGCCCAACATGCTCAAGgccatcgccggcactgcccgtca
aggtcgagccaacaccgcccgtggcagcctcccgcgcgcagcgccctcagcgccaccgtcgcgccagcagc
cgccaccgctcgatcttctctgcccgcgcgcgcgcgctcggtgcccgtgcccgtgagcgctgcccaccgccc
gcccacacgcgcgcgcgcgcgcgcAGCAGGCGAACGCGCTCGGTGCCAGCATCGTCCGTGCTGACGTGCTGC
CCCCACGAGCATGgcccgcgcgctgcccgc
cgcccgctgagcgctgagccttcgcgcctcttcttggaggaggcgccgctgagggcgctgacctgctgct
cgcttctgctgcccaccagcgcgcgccagcgcgccgctcgGTGCGCCACAGCACCGAGCGCTGACTG
GGCCCCAGCACGGCGCCGCTCTGCTGCGCAGTCGCACCGGGAGGAGGATGAGGATTGCGACGGCGGCCA
GGAGGGGGGGCGTGCCGCGGCGCATGAGCGAGGCGGACCTGCGTGCGCACCTGGCGGGCCTGGAGAAGGCC
ATGTGGGACTCGGAGCTGCCGCGCGCGCGCCATCCCGCGCGCAGAAGGCGCTCACCTACGCCGCGAGGAC
TGGTGAGTTGCTGCGCAGCCTGACGGCCATAGTTGCCGTAGTGCCATAGTGACCGAGCACCGTGATGTTT
AGGACATGGGCGGAGAAGTGTTAGGACATGAATTGCATCAACGCTGCAAATCTGGTGTATGGTACGCGCG

"Replacement Sheet"

FIG. 8 continued 38/40

QANAVGASIVGADVLPPTAVAAAAAAGTAAAAAVTGPALGRGAAASASSFEEGAAEAADLRRRFVATSRG
ASAAVGAPTAPAAMTGPQHGAASAAQSHREEDEDSHGGQEGGVPRRMSEADLRAHLAGLEKAMWDSELP
PPPSRAQKALTYAAGLLAVVAVFLVSSFFRRNDGAASALAPAAVTTASVAVSAQPAKPGKATRSAH*

Thermosynechococcus elongatus BP-1 tlr0758 (SEQ ID NO:191):

GTGCGCATTCCCCTCGATTATTACCAAGTGTGGGTGTGCCTATTCAGGCAACGCCGGAG
CAAATTGAGCAGGCCTTTCGGGACCGGCTGTTGCAGCTCCCTACCCATCAGCACTCCCC
ACCACAGTTGCCACCCGTCGCGAACTCATTGAGCAGGCCTATGCAGTTTTCGAGAACCG
GAGCAGCGCGATGCCCTACGATCGCCACTGCCGTACCGTTGATCCCGATGATTGATTGCC
CAGTTGGATCCCGATGCCACCACTCCCCACATTGAAATTAGTGATGAGCAATTGTCGGGG
GCACTCCTACTGCTGTATGAACTAGGAAATTATGCCCAAGTTGTCAACCTGGGAGACGCC
TTTCTTAAAAAGGATGTTTTTGAGCGCAATCGCCCCCTACACTTCCCCTGCCGCCGTTGCC
GACATTACCCTCACTGTGGCTTTGGCCTATCTGGAATTGGGACGGGAGGAATGGCAGCGG
CAGTCCTATGAATCAGCCGCTCTCAGCTAGAAGCCGGTCTCCAGGTACTTCAGCGGGTA
AATTTGTTTCCCGAGCTCCAGGAGCAGTTTCAGACGGAAGTGAATCGGCTGCGTCCCTAC
CGCATTCTGGAATTACTGGCACTGCCTTTGTCCGATAGTGCGAATCGGCAGCGGGTATT
TTATTGCTGCGGCAAATGCTGAGTGAGCGCGGGGCATTGAGGGGCGCGGTGACGATCGC
TCAGGACTAACAGTTGAGGATTTCTGAAATTTATTTTGCAACTGCGCAGCCATCTTACC
GTGGCAGAACAAACAGGAAGTCTTTGAACGGGAATCGCGGCGTCCCTCAGCGGTGGCCACC
TACCTTGCGGTACATGCCTTGGTAGCACGGGGAGTGCATGAACTGCAGCCGAGCTATATT
TGTCGGGGCAAGGATTTATTGCAGCAGCTGCTCCCCCATCAAGACGTCTATCTTGAACTT
GCCAGTTGCTTGCTGCTTTTGGGACAGCCACCGAGGCCTTGGCAGCTCTTGACCACAGC
CAAGATCAACCGACTCTGGACTTTATCCGCCGTCATGCCGGTGAGGCTGGCGATCGACTG
CCGGGGCTTTATTACTACACACACAATGGCTCACGGAGGAAATTTATCCTGCATTTCCG
GACTTGGGGGAAACACCCGTGGCCTTGGAGGCTTACTTTGCTGATGCCAATGTCCAAACC
TATCTAGAGGCTCTCAGTGAGGACTCCATTGCCCTGAACCCCTGCGACCACTGCCTCT
GCGCTCCCTGAAGTGATCAGACCAACGGTGGCCGTGCCCCCTCCCTCTCCTTCACAGCG
GAAACGTTACCGTTGCAGGATCAGAGTCGGCTGGGTGAGGCGCTTTTCGGCATCGGCTTTT
ACCCCTTCTGCAACTGCAACGGGGACATCGATGCCCCAACCATCGCCTCGCAAACGGCGC
AGCCCTCGAAACCGTTGCGCCCAAAACGTCAGACTTGGTTTTGGATGGGTGCAGGAGTG
GTTCTTGTGGGTTTAGGGGCGTTGGCAAAAGTCTATTGGCCCGCCAAACCGCTGAAGCC
CCCCCGCCGCGGTGACACCGGCACCAACTCCTGTGGCAACGCCGACCCCAACGCCACAA
CCGACGACCTTAGCCATCACTTTAACACCAGAGATGGCGCGGATCGCCTCCACACTTGG
CAGCAAATTAAAGCCCAAGCCCTTGGGCGACCATTTGAGGTGGACAACTAACAACGATT
TTGGCGGAGCCAGAACTCAGCCGCTGGCGATCGCGGGCACAGGGCTTAAAGTCCGAGGGC
AGCTATTGGGTTTATACCCTAAAGAACTTAGAAGTGAAGGAAGTCCGCCTCCAAAGGAGC
GATCGTGTGGAGGTGTTGGCAGAAGTCAACGAGGATGCCCGTTTCTATGAACAGGGAACC
CTGCGCACTGATATTTCTATAGCGATCCCTACCGGTCATTTATACCTTTATCCGTGCG
GGCAATCAATGGTTGATTCAAGGCATGCAGGTGGTTAGTTAA

Protein sequence:

>tlr0758 (SEQ ID NO:192):

MRIPLDYYQVLGVPIQATPEQIEQAFRDRLLQLPTHQHSPTTVATRRELIEQAYAVLREPEQRDAYDRHCRTVDP
DDLIAQLDPDATTPHIEISDEQLSGALLLLYELGNYAQVVNLGDAFLKDVFERNRPYTSPAAVADITLTVALAY
LELGREEWQRQSYESAASQLEAGLQVLQVRNLFPELQEQFQTELNRLRPYRILELLALPLSDSANRQGIILLRQ
MLSERGGIEGRGDDRSGLTVEDFLKFILQLRSHLTVAEQQELFERESRRPSAVATYLAVHALVARGVHELQPSYI
CRAKDLLQQLLPHQDVYLELASCLLLLQGPTEALALDHSQDQPTLDFIRRHAGEAGDRLPGLYYTTQWLTEEI
YPAFRDLGETPVALEYFADANVQTYLEALSIEDSIAPEPPATTASALPEVIRPTVAVPPPLSFTAETLPLQDQSR
LGQGLSASAFTPSATATGTSMPQSPRKRRSPRNRCAQKRQTFWFMGAGVVLVGLGALAKVYWPAKTAEAPPPV
TPAPTVPATPTPTPQPTTLAITLTPEMARDRLHTWQIQIKALGRPFVDKLTITLAEPELSRWRSSRAQGLKSEG
SYWVYTLKNLEVKEVRLQRSRDRVEVLAEVNEDARFYEQGLRTDISYSDPYRVIYTFIRRGNWLIQGMQVVS

"Replacement Sheet"

FIG. 8 continued 39/40

Trichodesmium erythraeum

Contig97 Gene 8639

(SEQ ID NO:193):

GTGCGGATTCCATTAGATTATTATCGAATTTTAGGTTTACCAATTCAGGCTACTGCTGAACAGTTGCGGCAGGCA
CATCA
AGACCGCACTCAGCAGTTTCCTAGAAGGGAGTATTCTGAAGCCACAATAGTTGCTCGTAAACAGCTTATAGATGA
GGCTT
ATGCTGTTCTTTGCGATCCTGAACAACGTCAAACCTATGATGGTAACTTTTTAGCTAAAACCTACGAGCCAATAG
TAGAA
GAACTCAATCCAAGTTCTCAGATAAATTTTGATCAAGCACAGAAGAAAGAAACCACTTAAGGAGACTAGAGAA
GTTCT
TCCGGAAATAGCTTCTAAACAGTTAAAAAAGGACAAGTTATCAAAACAGAGAGACTAAAGCTGCCTCTGATTT
TCATT
CTAATACCCCTAGTATAGAAATAGAATATCCACAATTTGTGGGAGCCATCCTAATTTTACATGAGCTAGGAGAAT
ATGAG
CTAGTATTAATAAATAACTCACCTTATCTTCTTAACAATAGTATAACTATTAAAGATGGACGTTTTGGAGACCCA
GCATT
AGTTTTGCCAGATGTTGTCTTACAGTTGCTCTAGCAAATTTAGAATTGGGCAGAGAGGAATGGCAACAAGGACA
ATACG
AAAGTGCAGCTACAGCTTTAGAGGCTGGCCTAGGGTTATTGCTACGAGAAAACCTATTTGTCCAAATACGAGGAG
AGATA
CAAGCTGACCTTTATAAGCTACGTCTTATAGAATAATGGAGCTAATAGCACTACCAGAGGAAATAGCTCTAGAC
CGTAG
CCGTGGACTAGAAATCTTCAAGATATGCTCAATGAACGGGGAGGAATTGATGGTCAAGGTGAAGATAGCTCTGG
ACTTG
GGATAGAAGATTTTCTAAAGTTTGTTCAGCAGCTACGTCAATACTTAACTACAGCAGAGCAAAGAAGTTATTTG
AGGCA
GAAGCCCTTCGCCCTTCGCGAGTTGGTGCATATCTAGCGGTTTATACTTTTTTAGCTCAAGGGTTTGTCTCAAAA
CAACC
AGCCTTTATTCGTAAAGCTAAGTTGATGTTAATGCAATTGGGTCTGGAGTCAAGATGTAAATTTAGAGAAATCTGT
CTGTG
CTTTACTTTTAGGGCAAACCTGAAGAAGCTAGTCGTTTATTAGAACTTAGCCATGAAAATGAACCTCTATCCTTTA
TTAA
GAAAATTCTCAACAATCTCCAGATTTATTGCCAGGTCTATGTCTCTATGCTGAACATTGGTTGACAGAGGAGGTT
TTTCC
ACATTTCCGTGATTTGTCTGACAAGTCAGCTTCTTTGAAAGATTATTTTGCAGATCAACATGTTCAAGCTTATCT
AGAAG
CTTTACCTACAGAAGCAGAGGTAGCTAATCAATGGGTAGTCGTTTACGCTCGTAGTAATCACAATAAAAAAC
AAATG
TTCGACCCCAAGGAACCTTGAGAAGTTGAATGTATCAGATTTGGAGGATAAAGATATTTCTCGGGTAGATGCTACT
GCTAC
TGTTATTGTTGCTTCTGGAAGTCAAGGAAGTTCTAATTTACTAGGGGCTAGTTCTGATGGGTTGCTTCAAGAATT
AGAAA
AATCATCATCTACTAGAGGTGGGCCAAAACAAGTAACTACTAAGAGTTCTAGTCACTATTTAGGAAAAATTAGGG
AAAAG
AGTATAAGTGGTTTACCTGAGTTTAAATGAAAGTACATCTATTGAGAGTGGGGGGTTACCCCAATCTATCCAAGAG
CATAG
TTCACGTAGAACTTCTGCTAGAAGAGAACCTGTAAAGTTTGGTCGTTTAAATATTAATCGCAATTGTGGGATTTTT
GTAA
TAGGATTTATTGGGTTGTTAACAATTAATACTATCGGCTGGTTAGTAAATGCTTTAGGATGGGAAAGAGAAAAAC
TGATG
ATACAATTGGATAGGCCTCCTATAGAAATCCCAGAACCTGATCGGGTTAACCTCGCAGCATCAGGACCGATAACA
AAAGA
AGTAGCAAGGCGAACAATTCAAAGTTGGTTAGATATCAAGGCTTCTGCTCTTGGTCCTAATCATAAATTTGAACA
ATTAC

"Replacement Sheet"

FIG. 8 continued 40/40

CAAAATATTTTAGTAGAACCGGCAC'TTTCTCGTTGGTTACCTACAGCTAATGCCCTGAAGCAAGAAAAGTCATACC
GTAGG
TATGAGCATGATTTAGAAAATAAGTAATATAAAGATGAGTAATACAAATTCTAATCTCGCTCAAGTAGATGCTAAA
GTGAT
AGAAAAGGTAGAGTTTTATTCTGACAATGGTAGATTAACTAATACTAACAATGAAAAC'TTATTTGTTTCGTTATGA
TTTAG
TTCGTAAAAGTCAAAAATGGCAAATTAGTAATTGGAAGGTATTGAGATAA

PROTEIN (SEQ ID NO:194):

VRIPLDYYRILGLPIQATAEQLRQAHQDRTQQFPRREYSEATIVARKQLIDEAYAVLCDPEQRQTYDGNFLAKTY
EPIVE
ELNPSSQINFDAQAEKETTLKETREVLPEIASKQLKKRTSYQNRETKAASDFHSNTPSIEIEYPQFVGAILILHE
LGEYE
LVLKITHPYLLNNSITIKDGRFGDPALVLPDVLTVALANLELGREEWQQGQYESAATALEAGLGLLLRENLFVQ
IRGEI
QADLYKLRPYRIMELIALPEEIALDRSRGLEILQDMLNERGGIDGQGEDSSGLGIEDFLKFVQQLRQYLTTAEQK
KLFEA
EALRPSAVGAYLAVYTFLAQGFAQKQPAFIRKAKMLMQLGRSQDVNLEKSVCALLLGQTEEASRSLELSHENEP
LSFIK
ENSQQSPDLLPGLCLYAEHWLTEEVFPHFRDLSDKSASLKDYFADQHVQAYLEALPTEAEVANQWVVVQPRRSNH
NKKQM
FDPKELEKLNVDLEDKDISRVDATATGIVASGSQGSSNLLGASSDGLLQELEKSSSTRGGPKQV'TTKSSSHYLG
KIREK
SISGLPEFNESSTIESGGLPQSIQEHSSRRTSARREPVKFGRILILIAIVGFLLIGFIGLLTIKTIGWLVNALGWE
REKLM
IQLDRPPIEIPEDRVNLAASGPITKEVARRTIQSWLDIKASALGPNHKIEQLPNILVEPALSRWLPTANALKQE
KSYRR
YEHDLEISNIKMSNTNSNLAQVDAKVIEKVEFYSDNGRLTNTNNENLFVRYDLVRKSQKWQISNWKVLR

Fig. 9

SEQ ID NO:11

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56041 actgtaaatt ttgataaata aaaaaaaaca aaaaaaagat cgccaaatca tatttcatac
56101 tatcagathtt aaacaatata atttgttcga cgatacagaa atattttacc tcacaggaag
56161 aggttgcgca gaaggagcca tggatgtgtt tggtcagagtc gagttgcttt gttgtaagta
56221 ggtaattgca agaaacttga gttgtctata aagcttttga atacttctct ttatatatac
56281 gtttacaaca attttttttt tttttttttt tctattttta caacaaattg ttttttatta
56341 taataataaaa cttaaacgaa aataaataat atctctttgt tctatttctt aaaaaagaaa
56401 ttagcttgta gtacttcaac gtatcttaac tctttagtct ttagtaggta tatatcatct
56461 atttatttat ttttattttt tttatattac gattatagtgt tacgtacgta tttattaatc
56521 aaaaataact tggtagaagt aaaaagaaaa tgattttttt tttactcagt gatcagtttt
56581 acgtttattc aaaaataagt tgtagtttcc ttcttaatat tcaagttata tgactaaaaa
56641 ttggtcgggt aattttactat taagattaat cggaaactct agttagatca cgagataatc
56701 atcacgtgga gaaacatttg gttcttgtca cgtggagaaa acgttaagct tattttttac
56761 ttctttatta tatttttgag gaaatgggtg aaagaaagag agtggtttaa atgtgaatgc
56821 gctcgtagtt aggtggaggt taatgggtag gaggttaggt catatgtgta ttagtgatgg
56881 ataaaaatta aaacataaaa aaaaacttca agctgtaaat aatctaataa aagaacatag
56941 aaatataatc aaagaaccat ttaactaaat aaatactttc gattcaataa gcatatttct
57001 aagttccaag aatagctatc ctctatccac atgttacatt ttttttttct ttttcacatc
57061 catatagttt ttaaaataat tttctagatg gtatttttta ttogacattt ttttttctct
57121 ttagattttac tgattataat ttatttagaa ataaatgata cgactgtcgt ttctacaaaa
57181 ctgaaatttg caaacatttg accaaaaagc gaaaccttaa tcaactgaaa cgacaacggt
57241 ctttagtatg tttttggaca tacaagtag acataagatg ttccctcact cttcgattgt
57301 ttcttaacct aatataatta agcaatattg aacttgagtc actcaatgct gcaccgaagg
57361 agcctttaga ttttgagcaa attcatgaga gtttagcttc tcattcatca ctctgaattt
57421 ctcttttatc ctctttatct gtccaaaaca tgacacataa cataatgta gttctcctgc
57481 atacttccaa tggcaaatag aaaaagagaa cattgatcat agaagtcagt ttggtttacc
57541 cttctgagct cgatctctgt gtcgcgtttc ttttgatcaa gtgattgccg gagattcgtg
57601 atgtcgagaa tactatcgag gtcgtcttca aatgcgtttt ccaactcttc ccggagaaga
57661 gcaggtaact tatcaacgat gggcattaga agaaaacagt tgaactgcag aacaaaagaa
57721 aacacagata caaacttttt aaaagaaaag tcatttttaa agcaagaaga atctgagtaa
57781 aaactgaagt aggagcaaac ctttaactca gcagaggcga gaaagtactc tcgtatgccc
57841 tggaaatatc gttggacca tgcgtacaca attctctcag aggaaggagc aagcttgagg
57901 ttccaaagtg tgctatctag aagatcagcc aaccgcattt ctggtgtctg aatactggaa
57961 cctgaatcga tgtttgaggc gagatggctt agctttacat ctgatcttga cttggtgtct
58021 gttgtgccac ctaatgcac ttggggaaga ctaaatecta tggcattacc tgatgtcgta
58081 ttatgctctg ttccaccaa tgagtccaag aattgacgta gaccagctcg gttctacata
58141 acattgagaa acgaaaacta ctcaatcaga aacggatact tgatggtatg tacacaactc
58201 aattggattg aaacagagct atagggctgt agcaatgacc ttggttgtaa gagaccatgt
58261 aacatagcga gttgtacttg ctaaatectc catacatctg caaacaatat aaatccaaa
58321 gggatgacaa tcaactaaag tcaactagaac acaggtagga ggcaccgaca tggtaagaac
58381 aggaattgga aatagaatta cttgtcacga catgattttt ctgtggactc caaaaactg
58441 ttgaatgctg aagcaaccgg cttgagaaac acctcatgcc cacttaataa ttcaccttct
58501 ttctattcaa atttagaaca tacatcaaaa aatttgctgg aaagggatca tgagtatgat
58561 accgtcaaac caaagaaaac agtacctacc tgaagaagat atacagaaat tggagcaat
58621 ctcttgagaa tgtgtagaag cctcgcccc taaactatca acgcaaaaac aacgaaaatg
58681 agaactggaa aaaactttct gtatggaaag agaaacatgt gaataacaaa atttcagatg
58741 aaagtattcc caaacatagt ttctgttaag agaactgtt tactcgataa ctttatgca
58801 caaataagtt ccagcaaatc tcaaaactga atggtagtat gatttcaata tataacgtta
58861 tatttcattt ttttttttac gtacagtaca ctttaactaa ttagtaaaat tgctttccat
58921 cctccacgaa agaaaaagaa aaaagtagct atatctatgt cacctgatga aggaaaggtt
58981 caaacgtctc acgagccttc gcaactgcta taacacaagc tgttctacaa cagcaataa
59041 gagaaagaga ataagaggcc atagaaaaca tgacaaacgt tgcagctcag attagatact

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Fig. 9, continued 2/3

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59101 gaaaggggtc tgggatgcaa agacaataaa ttgagaagtg tgttgcatgt cagtcaatcc
59161 tatgatacct ggaatagttt gttccatcat gaatatcctc aactccacat gcatttacaa
59221 tttcctccct cgttattggg ggacatttga tagcaccaac tagaaaacga aactcagcca
59281 tggcacggtg atattgtgca ccccataga gacgcacccc tgcattctgt aaaatgaaag
59341 ataactctgt tatggtctct cataattctt gaagggtccaa cgaagtatct cttttatttg
59401 tttccaatac attattcttt ggcacatatg tttcatgagg tcaaatttat cttccatcat
59461 attataatcc atgtacaaga acaagacaac tggatttgaa gaccatgccc agcttgctct
59521 ataaagtcca acaatattct gcttcaggga aagacttacc ggtattagct tatgtgaaaa
59581 ctggagacca tcagtaccaa caaatgtctc tccttggtgc ctttcatctt gcagtgtctc
59641 acctgaaaaa caccatgaga aattattaac aatcaaagaa cccaacataa agagaatgct
59701 gttataaaaat gtgcttctgc cagtaaccaa agtatcatga ccaatgattg attgattagc
59761 tcaataaaca ccatgtgtaa tcatcgcatg ctggtgaccc agtcgaattg aacagaatgc
59821 atttaactaa actgattttg caaaagtcca atttaacaac acccagaaac aagaaaagtt
59881 tatgccaaag aagttgacta gcagagaaca gagcagtaac attaccaaat ttatctgga
59941 gggccacaac tgttcccttc aataacagcg ataactgatc aagaaaaata taaacaaaac
60001 aggtgagaaa acacagcact gatcaatact aacaaaggta ctctgtacgt caatcaga
60061 atatgacgca gcaattttta agtcttaagg gcatccaaca caaaaagttt acagccattc
60121 tgaatttgta gcaagtccta gatatacttt actgtagcat aattttatat gtgtcagtaa
60181 tcaataaaca aatttgtttt tatgtgtcag tagttaataa accaaaaaaa aagagaagtt
60241 tacacaaatg aacttggtgt aattatacaa aaactattaa tccacgagtc caggcaaaaa
60301 tgaaaaggta tgggaagggtg taaatagaaa tctaaaaaaa cgaaatgctc tctacagtta
60361 ccttggttaa gaagagatca tggaaagtcc tgcctctctc tttgagtttt gcttcattca
60421 aagagctgca ttgaaaggaa ttattcaacc tccaatgagt tatattttct ataaatcagt
60481 agctaacaat taaactgcct aaaatcaagt agacattttc agacaaaaca aattgcgacc
60541 taagttcctt gctcacggta tccagctttt tgactgtact gcggtactcc tttcctaaca
60601 gtggaatgat caatggaaca ctctctttgt acctggaag agaggggcat caagactaca
60661 gcgaaaagta aactacaata gaaacagagg ctggaaaaat cagagttaaa acaacagtta
60721 taccttttcc agagtagttc ttccagaaac aaactcagtt tactgatgcc aatcctactc
60781 ttttctgtt ttgtcagtaa acggcccaac ttcttctcta aagatgcaat gtcttccatt
60841 tctctaagtg acacagcctg taataaaaaac cacacatagt ttagaaaaag acctgtttta
60901 cttgtttaag gaatcagaca gcagagcaga gacctgtttg aactcgtcat tagacttata
60961 cactgaatcc tgtccatagc caactcttcc agaaggcaca gacgtgaaaa aaggagaatc
61021 gcccataacc gagctgtcaa gtgcgtttgc aggaggtgag agaaagactt ccacagcaga
61081 tgaacatgag aattgaggga ttttagtgtc aagctttgta gaaacaacaa ttgtcctaga
61141 aagctcagga tcaacctaca tgaacgagaa acaaacttta acaaaaaata agacaagggtt
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61261 tgetccagtc actgctatct tcgaggcata aaatgatgaa ctctttgtgt tgcattcttg
61321 ctcgactag agcttccaca gcccggtgctt gaacctaaaga aaaagaacaa gtaaccact
61381 ctcaaataaa gcaaaaccaa aacatgaaat cagccacgga attggctgga agccataaga
61441 aaaaacaacc tgaagagctc ggtttttcag tctggtgca ggagcaataa gtccaggtgt
61501 atcaatgatg gtaaggtttg gacaatactt atactggact ttcacaataa tctcctttgc
61561 agagaatggg ctacatggct cttgtctcag cctcatgttc tcagcctcaa tatatgcta
61621 actccaaatc atataacaaa tttcgtaaac atgagcattt cgcttctcta caataaacct
61681 aagtacttgt gtttctcaac attcgtcaaa atcttcccag aatttatacg cagaaacaag
61741 caattgaaga agcacaagta ataataataa caaaacacct gaatttgtga gagagatttg
61801 ggaagagaaa cggaaggatc atcatcagat ccgagatgac aaagcgggaa ttgacactga
61861 ggatcgtact tcatatggag agtaatcgcc cgacgagtct tgggtccgcc gccgacatgg
61921 ttaaattgaa accccataag agcttccaca agcgcacttt taccgtcggc ctgctgtccc
61981 accacaagaa ccgcccgtgc ttcgaaacggc gtctccaatt cctgcgccaa agcgtgtaac
62041 tegtgtgtaag cttcgtaaac actccaccgc tctcaatcg cagcgtcgtc ctcttccgcc
62101 atttctcaa ccgtcaccga ttttgctgat acttccgcca tegtctctta cgaaaatgag
62161 caagaggaag agtaagagta agagagtgtc tcttatttct tctactcttt agttttcgtc
62221 gccgttctt tttccgccat ggaattagca gatacggcta atttcaattt ttgtcaaaag
62281 aaatattttt tgtgttttaa tctcacgcgc atccatggcg cgttgagtca acgttgtaat
62341 agttctccgc taaattttaa taaaagagcg cgtaaggaga gagtttaagg attttttttt
62401 tttggtcggc aaatacaaaag gatttgcttt gtcttgacca atagtatatg cagaaatatt

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Fig. 9, continued 3/3

62461 atctcaaagg atttgtgata actatgtagt acagaattgt gattattgga tgagaaacca
62521 gaaatatttt gagcaaatga cgacttggtta atttactatt ttttcatttc ttaaaggtct
62581 ctottgtgta actatgatta aaattgaaat agtgactttt attgttacga catggaacaa
62641 atcaacgagt tctattgtta aagagagaca ttgatgaatg taacaaaact gtggccttaga
62701 agccgaaagg agacttagtt cgggtccctc cttcaccgta ttgctcggtc cattttctca
62761 attcggttcat tgtcgtcgcg tcgtatgccg ctgacggact tacctgcaaa ttacattaca
62821 atgacgcaat ttcgataatg caaacaccag gggaaaaaac atgaatagag atgatgatga
62881 tgttttttaa gagattgatc aataccttag ctttggattg aatgaagtcg tccaaactca
62941 gtggtcgtag atcagggggac gcatttggtta ccgagtcctg ataattcgac gtttcaaaag
63001 catggagtga gtacaaaaat tatttttcgt aacaacagaa atcaactgtg tgggtttatg
63061 catgtcctta ccttggtttc ttcttgtaac aattcctgaa caggtctgta tgcagctgct
63121 atgcatagat tctgcaatgt aagaaaagaa aaggaatcag aactactgtg ttgaatcata
63181 ctogaacttg taaatgaaac cccgaatgac caaaccttta gatcgcttcc tgaatatcct
63241 tcggtttcct ttgcaagttt atcaaaactg aaaccagttt caagattttc tgggtgcaga
63301 aatatcttca atatatctca ccggttttcc gcatctggta aatccacata tatcctataa
63361 acacaagcct caatacaatt atcgaaaaga tacaatatt ccaaaggaga aattacttga
63421 aagcttaaatt taccgtcttg gtacgctacg aatgacagcg tcatcaagat caaaaggtcg
63481 gttgggtggca ccgagaatga gaatcctttg gctatctttt gatctgagtc catcccaagc
63541 tgccataaac tcattttctca ttcttcgtgt tgctcgtgc tcaaaagcac caccacgagc
63601 acccaacaaa ctgtcaacct atacgacaac aaaataaatt acagttagtc cttgagtaac
63661 acattttacg catcacaaaa gtattcctca taaaaagcaa taaccgaaat tgaaaagtga
63721 tataaagcta aacaatttct cacctcatca acaaatataa tgacgggggc tagtttgctt
63781 gcaaaagaga acaaagcctt cgtgagcttc tctgcatctc caaaccactg tgccaaacaa
63841 tggacgaaat tgacttaaatt cagaaccaat cagaggtaaa gttggaaaga gatttactct
63901 aagttacaat cggcattgac aataataagt cgatgaccgg ggtggaaaag tttttcttat
63961 gtcattagat attctcctta tttatatgaa gatgtttaca aagtgaata tcaacgtgac

Fig. 10

SEQ ID NO:12

gaaa ttagccgtat ctgctaattc catggcggaa aaaggaacgg
cgacgaaaac taaagagtag aagaaataag agacactctc ttactcttac
tcttcctctt gctcattttc gtaagagacg

ATGGCGGAAGTATCAGCAAAATCGGTGACGGTTGAGGAAATGGCGGAAGA
GGACGACGCTGCGATTGAGGAGCGGTGGAGTCTTTACGAAGCTTACAACG
AGTTACACGCTTTGGCGCAGGAATTGGAGACGCCGTTTGAAGCACCGGCG
GTTCTTGTGGTGGGACAGCAGACCGACGGTAAAAGTGCGCTTGTGGAAGC
TCTTATGGGGTTTCAATTTAACCATGTCGGCGGCGGAACCAAGACTCGTC
GGCCGATTACTCTCCATATGAAGTACGATCCTCAgTGTCAATTCCTGCTT
tGTCATCTCGGATCTGATGATGATCCTTCCGTTTCTCTTCCCAAATCTCT
CTCACAAATTCACGCATATATTGAGGCTGAaAACATGAGGCTGGAGCAAG
AGCCATGTaGCCCCATTCTCTGCAAAGGAGATTATTGTGAAAGTCCAGTAT
AAGTATTGTCCAAACCTTACCATCATTGATACACCTGGACTTATTGCTCC
TGCACCAGGACTGAAAAACCGAGCTCTTCAGGTTCAAGCACGGGCTGTGG
AAGCTCTAGTCCGAGCAAAGATGCAACACAAAGAGTTCATCATTTTATGC
CTCGAAGATAGCAGTGACTGGAGCATTGCAACCACTCGAAGGATAGTGAT
GCAAGTTGATCCTGAGCTTTCTAGGACAATTGTTGTTTCTACAAAGCTTG
ACACTAAAATCCCTCAATTCTCATGTTTCATCTGACGTGGAAGTCTTTCTC
TCACCTCCTGCAAGCGCACTTGACAGCTCCTTATTGGGCGATTCTCCTTT
TTTCACGTCTGTGCCTTCTGGAAGAGTTGGCTATGGACAGGATTCACTGT
ATAAGTCTAATGACGAGTTCAAACAGGCTGTGTCACTTAGAGAAATGGAA
GACATTGCATCTTTAGAGAAGAAGTTGGGCGGTTTACTGACAAAACAGGA
AAAGAGTAGGATTGGCATCAGTAACTGAGGTTGTTTCTGGAAGAACTAC
TCTGGAAGGTTACAAAGAGAGTGTTCATTGATCATTCCTGTTAGGA
AAGGAGTACCGCAGTACAGTCAGAAAGCTGGATACCGTGAGCAAGGAAC
TAGCTCTTTGGATGAAGCAAACTCAAAGAGAGAGGCAGGACTTTCCATG
ATCTCTTCTTAACCAAGTTATCGCTGTTATTGAAGGGAACAGTTGTGGCC
CCTCCAGATAAAATTTGGTGAGACACTGCAAGATGAAAGGACACAAGGAGG
AGCATTTGTTGGTACTGATGGTCTCCAGTTTTTCACATAAGCTAATACaGA
ATGCAGGGATGCGTCTCTATGGGGGTGCACAATATCACCGTGCCATGGC
TGAGTTTTCGTTTTCTAGTTGGTGCTATCAAATGTCCCCCAATAACGAGGG
AGGAAATTGTAAATGCATGTGGAGTTGAGGATATTCATGATGGAACAAA
CTATTCCAGAACAGCTTGTGTTATAGCAGTTGCGAAGGcTCGTgAGACGT
TTGAACcTTTCCTTCATCAGTTAGGGGCGAGGCTTCTACACATTCTCAAG
AGATTGcTTCCAATTTCTGTATATCTTCTTCAGAAAGAAGGTGAATATTT
AAGTGGGCATGAGGTGTTTCTCAAGCGGGTTGCTTCAGCATTCAACAGTT
TTGTGGAGTCCACAGAAAAATCATGTCGTGACAAATGTATGGAGGATTTA
GCAAGTACAACCTCGCTATGTTACATGGTCTCTTCACAACAAGAACCGAGC
TGGTCTACGTCAATTCTTGGAcTCATTTGGTGGAACAGAGCATAATACG
ACATCAGGTAATGCCATAgGATTAGTCTTCCCCAAGATGCATTAGGTGG

Fig. 10, continued 2/2

CACAACAGACACCAAGTCAAGATCAGATGTAAAGCTAAGCCAT
CTCGCCTCAAACATCGATTCCAGTTCCAGTATTCAGACAACAGAAATGCG
GTTGGCTGATCTTCTAGATAGCACACTTTGGAACCGCAAGCTTGCTCCTT
CCTCTGAGAGAATTGTGTACGCATTGGTCCAACAGATATTCCAGGGCATA
CGAGAGTACTTTCTCGCCTCTGCTGAGTTAAAGTTCAACTGTTTTCTTCT
AATGCCCATCGTTGATAAGTTACCTGCTCTTCTCCGGGAAGAGTTGGAAA
ACGCATTTGAAGACGACCTCGATAGTATCTTCGACATCACGAATCTCCGG
CAATCACTTGATCAAAAGAAACGGAGCACAGAGATCGAGCTCAGAAGGgT
AAAGAGGATAAAAGAGAAATTCAGAGTGATGAATGAGAAGCTAAACTCTC
ATGAATTTGCTCAAAATCTAAAGGCTCCTTCGGTGCAGCAT

gtgact

caagttcaatattgcttaattatattaggttaagaaacaatcgaagagtg
agggaaacatcttatgtgtactttgtatgtccaaaaacataactaaagaacg
ttgtcgtttcaagtgattaagggtttcgctttttgggtccaatgtttgcaaa
tttcagttttgtagaaacgacagtcgtatcatttatttctaataaatta
taatcagtaaattct

Fig. 11

SEQ ID NO:13

MAEVSAKSVTVEEMAEEDDAAIEERWSLYEAYNELHALAQELETPFEAPAVLVVGQQTGKSALVEALMG
FQFNHVGGGKTRRPITLHMKYDPQCQFPLCHLGSDDDPSVSLPKSLSQIHAYIEAENMRLEQEPSPFS
AKEIIVKVQYKYCPNLTIIDTPGLIAPAPGLKNRALQVQARAVEALVRAKMQHKEFIILCLEDDSSDWSIA
TTRRIVMQVDPELSRTIVVSTKLDTKIPQFSCSSDVEVFLSPPASALDSSLLGDSPPFTSVPSGRVGYGQ
DSVYKSNDEFKQAVSLREMEDIASLEKKLGRLLTKQEKSRIGISKLRFLFLEELLWKRYKESVPLIIPLLG
KEYRSTVRKLDTVSKELSSLDEAKLKERGRTFHDLFTKLSLLLKGTVVAPPDKFGETLQDERTQGGAFV
GTDGLQFSHKLIQNAGMRLYGGAQYHRAMAEFRFLVGAIKCPPITREEIVNACGVEDIHDGTNYSRTACV
IAVAKARETFEPFLHQLGARLLHILKRLLPISVYLLQKEGEYLSGHEVFLKRVASAFNSFVESTESCRD
KCMEDLASTTRYVTWSLHNKNRAGLRQFLDSFGGTEHNTTSGNAIGFSLPQDALGGTTDTKSRSDVKLSH
LASNIDSGSSIQTTEMRLADLLDSTLWNRKLAPSSERIVYALVQQIFQGIREFLASAELKFNCFLMPI
VDKLPALLREELLENAFEDDLDISFDITNLRQSLDQKKRSTEIELRRVKRIKEKFRVMNEKLSHEFAQNL
KAPSVQH

Fig. 12

SEQ ID NO:14

56041 actgtaaatt ttgataaata aaaaaaaca aaaaaaagat cgccaaatca tatttcatac
56101 tatcagattt aaacaatata atttgttcga cgatacagaa atattttacc tcacaggaag
56161 aggttgcgca gaaggagcca tggatgtgtt tgttcgagtc gagttgcttt gttgtaagta
56221 ggtaattgca agaaacttga gttgtctata aagctttgga atacttctct ttatatatac
56281 gtttacaaca attttttttt tttttttttt tctattttta caacaaattg ttttttatta
56341 taataataaa cttaaacgaa aataaataat atctctttgt tctatttctt aaaaaagaaa
56401 ttagcttgta gtacttcaac gtatcttaac tctttagtct ttagtaggta tatatcatct
56461 atttatttat ttttattttt tttatattac gattatagtg tacgtacgta tttattaatc
56521 aaaaataact tggtagaagt aaaaagaaaa tgattttttt tttactcagt gatcagtttt
56581 acgtttattc aaaaataagt tgtagtttcc ttcttaatat tcaagttata tgactaaaaa
56641 ttggtcgggt aatttactat taagattatc cggaactctt agttagatca cgagataatc
56701 atcacgtgga gaaacatttg gttcttgcga cgtggagaaa acgttaagct ttttttttac
56761 ttctttatta tttttttgag gaaatgggtg aaagaaagag agtgtttaaa atgtgaatgc
56821 gctcgtagtt aggtggaggt taatgggtag gaggttaggt catatgtgta ttagtgatgg
56881 ataaaaatta aaaacataaa aaaaacttca agctgtaaat aatctaataa aagaacatag
56941 aaatataatc aaagaacctt ttaactaaat aaatactttc gattcaaata gcataattct
57001 aagttccaag aatagctatc ctctatccac atgttacatt ttttttttct ttttcacatc
57061 catatagttt ttaaaataat tttctagatg gtatttttta ttcgacattt ttttttctt
57121 ttagattttac tgattataat ttatttagaa ataaatgata cgactgtcgt ttctacaaaa
57181 ctgaaatttg caaacatttg accaaaaagc gaaaccttaa tcacttgaaa cgacaacgtt
57241 ctttagtatg tttttggaca tacaagtagt acataagatg ttccctcact cttcgattgt
57301 ttcttaacct aatataatta agcaatattg aacttgagtc actcaatgct gcaccgaagg
57361 agccttttaga ttttgagcaa attcatgaga gtttagcttc tcattcatca ctctgaattt
57421 ctcttttatc ctcttttatc gtccaaaaca tgacacataa cataatgtta gttctcctgc
57481 atacttccaa tggcaaatag aaaaagaga cattgatcat agaagtcagt ttggtttacc
57541 cttctgagct cgatctctgt gctccgtttc ttttgatcaa gtgattgccg gagattcgtg
57601 atgtcgaaga tactatcgag gtctgtctta aatgcgtttt ccaactcttc cgggagaaga
57661 gcaggtaact tatcaacgat gggcattaga agaaaacagt tgaactgcag aacaaaagaa
57721 aacacagata caaacttttt aaaagaaaag tcatttttaa agcaagaaga atctgagtaa
57781 aaactgaagt aggagcaaac ctttaactca gcagaggcga gaaagtactc tcgtatgcc
57841 tggaatatct gttggaccaa tgcgtacaca attctctcag aggaaggagc aagcttgccg
57901 ttccaaagtg tgctatctag aagatcagcc aaccgcattt ctgttgctctg aatactggaa
57961 cctgaatcga tgtttgaggc gagatggctt agctttacat ctgattgccg cttggtgtct
58021 gttgtgccac ctaatgcac ttggggaaga ctaaatccta tggcattacc tgatgtcgta
58081 ttatgctctg ttccaccaa tgagtccaag aattgacgta gaccagctcg gttctacata
58141 acattgagaa acgaaaacta ctcaatcaga aacggatact tgatggtagt tacacaactc
58201 aattggattg aaacagagct atagggctgt agcaatgacc ttgttgtaga gagaccatgt
58261 aacatagcga gttgtacttg ctaaatcttc catacatctg caaacaatat aaaatccaaa
58321 gggtagatcaa tcaactaaagc tcaactagaac acaggttaga ggcaccgaca tggtaagaac
58381 aggaattgga aatagaatta cttgtcacga catgattttt ctgtggactc cacaaaactg
58441 ttgaatgctg aagcaaccgc cttgagaaac acctcatgcc cacttaataa ttcaccttct
58501 ttctattcaa atttagaaca tacatcaaaa aatttgctgg aaagggatca tgagtatgat
58561 accgtcaaac caaagaaaac agtacctacc tgaagaagat atacagaaat tgggaagcaat
58621 ctcttgagaa tgtgtagaag cctcgccctt aactatatca acgcaaaaac aacgaaaatg
58681 agaactggaa aaaactttct gtatggaaag agaaacatgt gaataacaaa atttcagatg
58741 aaagtattcc caaacatagt ttctgtaagc agaacatgtt tactcgataa ctcttatgca
58801 caaataagtt ccagcaaatc tcaaaactga atggtagtat gatttcaata tataacgtta
58861 tatttcattt ttttttttac gtacagtaca ccttaactaa ttagtaaaat tgctttccat
58921 cctccacgaa agaaaaagaa aaaagtagct atatctatgt cacctgatga aggaaaggtt
58981 caaacgtctc acgagccttc gcaactgcta taacacaagc tgttctacaa cagcaataa
59041 gagaaagaga ataagaggcc atagaaaaca tgacaaacgt tgcagctcag attagatact

Fig. 12, continued 2/3

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59101 gaaaggggtc tgggatgcaa agacaataaa ttgagaagtg tgttgcatgt cagtcaatcc
59161 tatgatacct ggaatagttt gttccatcat gaatatcctc aactccacat gcattttacaa
59221 tttcctccct cgttattggg ggacatttga tagcaccaac tagaaaacga aactcagcca
59281 tggcacggtg atattgtgca ccccataga gacgcatccc tgcattctgt aaaatgaaag
59341 ataactctgg tatggtctct cataattctt gaagggtccaa cgaagtatct cttttatttg
59401 tttccaatac attattcttt ggcacatatg tttcatgcgg tcaaatttat ctcccatcat
59461 attataatcc atgtacaaga acaagacaac tggatttgaa gaccatgccc agcttgctct
59521 ataaagtcca acaatattct gcttcaggga aagacttacc ggtattagct tatgtgaaaa
59581 ctggagacca tcagtaccaa caaatgctcc tccttggtgc ctttcatctt gcagtgtctc
59641 acctgaaaaa caccatgaga aattattaac aatcaaagaa cccaacataa agagaatgct
59701 gttataaaat gtgcttctgc cagtaaccaa agtatcatga ccaatgattg attgattagc
59761 atacatcatt ccatgtgtaa tcatcgcatg ctggtgaccc agtcgaattg aacaatatgc
59821 atttaacata actgattttg caaaagtcca atttaacaac acccagaaac aagaaaagtg
59881 tatgccaag aagttgacta gcagagaaca gagcagtaac attaccaaat ttatctggag
59941 gggccacaac tgttcccttc aataacagcg ataactgatc aagaaaaata taaacaaaaa
60001 aggtgagaaa acacagcact gatcaatact aacaaaggta cttcgtacgt caatcagaaa
60061 atatgacgca gcaattttta agtcttaagg gcatccaaca caaaaagttt acagccattc
60121 tgaatttgta gcaagtccta gatatacttt actgtagcat aattttatat gtgtcagtaa
60181 tcaataaaca aatttgtttt tatgtgtcag tagttaataa accaaaaaaa aagagaagtt
60241 tacacaaatg aacttgttgt aattatacaa aaactattaa tccacgagtc caggcaaaaa
60301 tgaaaaggta tgggaagggt taaatagaaa tctaaaaaaa cgaaatgctc tctacagtta
60361 ccttggttaa gaagagatca tggaaagtcc tgcctctctc tttgagtttt gcttcatcca
60421 aagagctgca ttgaaaggaa ttattcaacc tccaatgagt tatattttct ataaatcagt
60481 agctaacaat taaactgcct aaaatcaagt agacattttc agacaaaaca aattgcgacc
60541 taagttcctt gctcacggta tccagctttc tgactgtact gcggtactcc tttcctaaca
60601 gtggaatgat caatggaaca ctctctttgt acctggaag agaggggcat caagactaca
60661 gcgaaaagta aactacaata gaaacagagg ctggaaaaat cagagttaaa acaacagtta
60721 taccttttcc agagtagttc ttccagaaac aacctcagtt tactgatgcc aatcctactc
60781 ttttctgtt ttgtcagtaa acggcccaac ttcttctcta aagatgcaat gtcttccatt
60841 tctctaagtg acacagcctg taataaaaaa cacacatagt ttagaaaaag acctgtttta
60901 cttgtttaag gaatcagaca gcagagcaga gacctgtttg aactcgtcac tagacttata
60961 cactgaatcc tgtccatagc caactcttcc agaaggcaca gacgtgaaaa aaggagaatc
61021 gcccaataag gagctgtcaa gtgcgcttgc aggaggtgag agaaagactt ccacgtcaga
61081 tgaactagag aattgagga ttttagtgc aagctttgta gaaacaacaa ttgtcctaga
61141 aagctcagga tcaacctaca tgaacgagaa acaaaactta acaaaaataa agacaaggtt
61201 agacgcaatg gagttacgtc aagcaacgta cttgcatcac tatccttcga gtggttgcaa
61261 tgetccagtc actgctatct tcgaggcata aaatgatgaa ctctttgtgt tgcatttttg
61321 ctcgactag agcttcaca gcccggtgct gaacctaaaga aaaagaacaa gtaaccact
61381 ctcaataaaa gcaaaaccaa aacatgaaat cagccacgga attggtcgga agccataaga
61441 aaaaacaacc tgaagagctc ggtttttcag tcttggtgca ggagcaataa gtccaggtgt
61501 atcaatgatg gtaaggtttg gacaatactt atactggact ttcacaataa tctcctttgc
61561 agagaatggg ctacatggct cttgctcag cctcatgttc tcagcctcaa tatatgccta
61621 actccaaatc atataacaaa tttcgttaac atgagcattt cgcttctcta caataaacct
61681 aagtacttgt gtttctcaac attcgtcaaa atcttcccag aattttatag cagaaacaag
61741 caattgaaga agcacaagta ataataataa caaaacacct gaatttgtag gagagatttg
61801 ggaagagaaa cggaaggatc atcatcagat ccgagatgac aaagcgggaa ttgacactga
61861 ggaatcgact tcatatggag agtaatcggc cgacgagctt tggttccgcc gccgacatgg
61921 ttaaattgaa accccataag agcttcaca agcgcacttt taccgtcggt ctgctgtccc
61981 accacaagaa ccgcccgtgc ttcgaacggc gtctccaatt cctgcgcaa agcgtgtaac
62041 tcgttgtaag cttcgtaaa actccaccgc tctcaatcg cagcgtcgtc ctcttcgcc
62101 atttctcaa ccgtcaccga ttttgctgat acttccgcca tcgtctctta cgaaaatgag
62161 caagaggaag agtaagagta agagagtgtc tcttatttct tctactcttt agttttcgtc
62221 gccgttcctt tttccgccat ggaattagca gatacggcta atttcaattt ttgtcaaaag
62281 aaatattttt tgtgttttaa tctcacgcgc atccatggcg cgttgagtca acgttgtaat
62341 agttctccgc taaatttaaa taaaagagcg cgtaaggaga gagtttaagg attttttttt
62401 tttggtcggc aaatacaaa gatttgcttt gtcttgacca atagtatatg cagaaatatt

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Fig. 12, continued 3/3

62461 atctcaaagg atttgtgata actatgtagt acagaattgt gattattgga tgagaaacca
62521 gaaatatttt gagcaaatga cgacttgta atttactatt ttttcatttc ttaaagggtct
62581 ctcttgtgta actatgatta aaattgaaat agtgactttt attgttacga catggaacaa
62641 atcaacgagt tctattgtta aagagagaca ttgatgaatg taacaaaact gtggcttaga
62701 agcggaaagg agacttagtt cgggtccctc cttcacgta ttgctcggtc cattttctca
62761 attcgttcat tgcgtcgcg tcgtatgcca ctgacggact tacctgcaa ttacattaca
62821 atgacgcaat ttcgataatg caaacaccag gggaaaaaac atgaatagag atgatgatga
62881 tgttttttaa gagattgatc aataccttag ctttggttg aatgaagtcg tccaaactca

Fig. 13

SEQ ID NO:15

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1  atggcggaag tatcagcaaa atcgggtgacg gttgaggaaa tggcggaaga ggacgacgct
61  gcgattgagg agcgggtggag tctttacgaa gcttacaacg agttacacgc tttggcgag
121  gaattggaga cgccgttcga agcaccggcg gttcttggtg tgggacagca gaccgacggt
181  aaaagtgcgc ttgtggaagc tcttatgggg tttcaattta accatgtcgg cggcggaacc
241  aagactcgtc ggccgattac tctccatatg aagtacgata ctcagtgtca attcccgtt
301  tgtcatctcg gatctgatga tgatccttcc gtttctcttc ccaaactctc ctcacaaatt
361  caggcatata ttgaggctga gaacatgagg ctggagcaag agccatgtag cccattctct
421  gcaaaggaga ttattgtgaa agtccagtat aagtattgtc caaaccttac catcattgat
481  acacctggac ttattgctcc tgcaccagga ctgaaaaacc gagctcttca ggttcaagca
541  cgggctgtgg aagctctagt ccgagcaaaag atgcaacaca aagagttcat cattttatgc
601  ctggaagata gcagtgactg gagcattgca accactcgaa ggatagtgat gcaagttgat
661  cctgagcttt ctaggacaat tgttgtttct acaaagcttg acactaaaat ccctcaattc
721  tcatgttcat ctgacgtgga agtctttctc tcacctctg caagcgact tgacagctcc
781  ttattgggcg attctccttt tttcacgtct gtgccttctg gaagagttgg ctatggacag
841  gattcagtgat ataagtctaa tgacgagttc aaacaggctg tgtcacttag agaaatggaa
901  gacattgcat ctttagagaa gaagttgggc cgtttactga caaacagga aaagagtagg
961  attggcatca gtaaaactgag gttgtttctg gaagaactac tctggaaaag gtacaaagag
1021  agtgttccat tgatcattcc actgttagga aaggagtacc gcagtacagt cagaaagctg
1081  gataccttat cgctgttatt gaagggaaca gttgtggccc ctccagataa atttggtgag
1141  aactgcaag atgaaaggac acaaggagga gcatttggtg gtactgatgg tctccagttt
1201  tcacataagc taataccgaa tgcagggatg cgtctctatg ggggtgcaca atatcacgt
1261  gccatggctg agtttcgttt tctagttggt gctatcaaat gtcccccaat aacgagggag
1321  gaaattgtaa atgcatgtgg agttgaggat attcatgatg gaacaaacta ttccagaaca
1381  gcttgtgtta tagcagttgc gaaggctcgt gagacgtttg aacctttcct tcatcagaaa
1441  gttttttcca gttctcattt tegtgtgttt tgcgttgata tagttagggg cgaggttct
1501  acacattctc aagagattgc ttccaatttc tgtatatctt cttcaggtag gtactgtttt
1561  ctttggtttg acggtgaata ttttaagtgg catgaggtgt ttctcaagcg ggttgcttca
1621  gcattcaaca gttttgtgga gtccacagaa aaatcatgtc gtgacaaatg tatggaggat
1681  ttagcaagta caactcgcta tgttacatgg tctcttcaca acaagaaccg agctggtcta
1741  cgtcaattct tggactcatt tgggtggaaca gagcataata cgacatcagg taatgccata
1801  ggatttagtc ttccccaaaga tgcattaggt ggcacaacag acaccaagtc aagatcagat
1861  gtaaagctaa gccatctcgc ctcaaacatc gattcagggt ccagtattca gacaacagaa
1921  atgcggttgg ctgatcttct agatagcaca ctttgggaacc gcaagcttgc tccttctct
1981  gagagaattg tgtacgcatt ggtccaacag atattccagg gcatacgaga gtactttctc
2041  gcctctgctg agttaaagtt caactgtttt cttctaatagc ccacgttga taagttacct
2101  gctcttctcc gggaagagtt ggaaaacgca tttgaagacg acctcgatag tatcttcgac
2161  atcacgaatc tccggcaatc acttgatcaa aagaaaacgga gcacagagat cgagctcaga
2221  aggataaaga ggataaaaaga gaaattcaga gtgatgaatg agaagctaaa ctctcatgaa
2281  tttgctcaaa atctaaaggc tccttcgggt cagcattga

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Fig. 14

SEQ ID NO:16

MAEVSAKSVTVEEMAEEDDAAIEERWSLYEAYNELHALAQELETPEAPAVLVVGQQT
GKSALVEALMGFQFNHVGGGKTRRPITLHMKYDPQCQFPLCHLGSDDDPSVSLPKSL
QIQAYIEAENMRLEQEPCSPFSAKEIIVKVQYKYCPNLTIIDTPGLIAPAPGLKNRAL
VQARAVEALVRAKMQHKEFIILCLEDSSDWSIATTRRIVMQVDPELSRTIVVSTKLD
TKIPQFSCSSDVEVFLSPPASALDSSLLGDSPPFTSVPSGRVGYQDSVYKSNDEFKQAV
SLREMEDIASLEKKLGRLTKQEKSRIGISKLRLFLEELLWKRYKESVPLIIPLLGKEYR
STVRKLDLTLSSLLKGTVVAPPDKFGETLQDERTQGGAFVGTGDLQFHKLIIPNAGMR
LYGGAQYHRAMAEFRFLVGAIKCPPIITREEIVNACGVEDIHDGTNYSRTACVIAVAKA
RETFEPFLHQKVFSSSHFRFCVDIVRGEASTHSQEIASNFCISSSGRYCFLWFDGEYLS
GHEVFLKRVASAFNSFVESTESCRDKCMEDLASTTRYVTWSLHNKNRAGLRQFLDSFG
GTEHNTTSGNAIGFSLPQDALGGTTDTKSRSDVKLSHLASNIDSGSSIQTTEMLADLL
DSTLWNRKLAPSSERIVYALVQQIFQGIREYFLASAEKFNCFLLMPIVDKLPALLREE
LENAFEDDLDSIFDITNLRQSLDQKKRSTEIELRRIKRIKEKFRVMNEKLNSHEFAQNL
KAPSVQH

Fig. 15

SEQ ID NO:17

MQELYTNRTVLNRPRFAVNVRPTRLKRNQQSQSKMQSHSKDPIN
AESRSRFEAYNRLQAAAVAFGEKLPIPEIVAIGGQSDGKSSLLEALLGFRFNVREVEM
GTRRPLILQMVDLSALEPRCRFQISRIFVELAILITDLDEDSEYGSPIVSATAVA
DVIRSRTTEALLKKTKTAVSPKPIVMRAEYAHCPNLTIIDTPGFVLKAKKGEPETTPDE
ILSMVKSLASPPHRILLFLQQSSVEWCSSLWLDVREIDSSFRRTIVVSKFDNRLKE
FSDRGEVDRYLSASGYLGENTRPYFVALPKDRSTISNDEFRRQISQVDTEVIRHLREG
VKGGFDEEKFRSCIGFGSLRDFLESELQKRYKEAAPATLALLEERCSEVTDDMLRMDM
KIQATSDVAHLRKAAMLYTASISNHVGALIDGAANPAPEQWGKTTEEERGESGIGSWP
GVSVDIKPPNAVLKLYGGAAFERVIHEFRCAAYSIECPPVSREKVANILLAHAGRGGG
RGVTEASAEIARTAAARSWLAPLLDTACDRLAFVLGSLFEIALERNLNQNSEYEKKTEN
MDGYVGFHAAVRNCYSRFVKNLAKQCKQLVRHHLDSVTSPYSMACYENNYHQGAFGA
YNKFNQASPNSFCFELSDTSRDEPMKDQENIPPEKNNGQETTPGKGGESHITVPETPS
PDQPCEIVYGLVKKEIGNGPDGVGARKRMARMVGNRNIEPFRVQNGGLMFANADNGMK
SSSAYSEICSSAAQHFAIREVLVERSVTSTLNSGFLTPCRDRLVVALGLDLFAVND
KFMDMFVAPGAIVVLQNERQQLQKRQKILQSCLTEFKTVARSL"

Fig. 16

SEQ ID NO:18

MANSNTYLTTPTKTPSSRRNQSQSKMQSHSKDPINAESRSRFEAYNRLQAAAVAFGEK
LPIPEIVAIGGQSDGKSSLLEALLGFRFNVREVMGTRRPLILQMVHDL SALEPRCRFQ
DEDSEYGSPIVSATAVADVIRSRTEALLKKTAVSPKPIVMRAEYAHCPNLTIIDTP
GFVLKAKKGEPETTPDEILSMVKSLASPPHRILLFLQQSSVEWCSSLWLDAREIDSSF
RRTIVVVSKEFDNRLKEFSRGEVDRLSASGYLGENTRPFVLPKDRSTISNDEFRRQ
ISQVDTEVIRHLREGVKGGFDEEKFRSCIGFGLRDFLESELQKRYKEAAPATLALLEE
RCSEVTDDMLRMDMKIQATSDVAHLRKAAMLYTASISNHVGALIDGAANPAPEQWGKTT
EEERGEGIGSWPGVSVDIKPPNAVLKLYGGAAFERVIHEFRCAAYSIECPPVSREKVA
NILLAHAGRGGRGVTEASAEIARTAAWSLAPLLDTACDRLAFVLGSLFEIALERNLN
QNSEYEKKTENMDGYVGFHAAVRNCYSRFVKNLAKQCKQLVRHHLDSVTSPYSMACYEN
NYHQGGAFGAYNKFNQASPNSFCFELSDTSRDEPMKDQENIPPEKNNGQETTPGKGGES
HITVPETPSPDQPCEIVYGLVKKEIGNGPDGVGARKRMARMVGNRNIEPFRVQNGGLMF
ANADNGMKSSSAYSEICSSAAQHFAIREVLVERSSTLNSGFLTPCRDLVVALGLD
LFAVNDDKFMDMFVAPGAIIVVLQNERQQQLQKRQKILQSCLTEFKTVARSL

Fig. 17

SEQ ID NO:19

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1  ttcattgttct tagaagttct aaatthttgat catctctttat ttgaaagctc aactaaaata
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121 tataattaaa acttggttaa ttcatacaca caaaggacaa atcttcttcg tattaaaaaa
181 gatggaggct ctggaacatc tagtggtgcc gtatcactta cttgactggt tcaagccgtt
241 tgtctttgtt tggaagaagt aaatthtaatt gtgggagagg gatttcacga atttaaatct
301 gttttttctcc cttttcgtgg tatactttgg accttttggg tatgaacaca tatgtgaaaa
361 cgttaattca tgtgtttgaa aagtaattaa tcgcgcgcgtc cgtcttatag ctttgggatg
421 ggccaatagg atatttaaga gataagaaaa ctaatcagaa acacagacga aggtatctca
481 ctctctctct ttctctctcc ATGAGAACTC TAATCTCTCA CCGGCAATGT GTGACGTCAC
541 CGTTTCTTAT CTCCGCCGCA TCTCCACCGT TTCTTGCCCG GTGCTTTAAG TTATCCTCCT
601 TTAATCCTCC ACGTCATAGG CGTTTTTCTT CTCTCTCGAT CAGAAACATT TCGCATGAAT
661 CCGCCGATCA GACTTCTTCT TCTAGCCGCG GAACTCTTTA TCCTGGTGGT TACAAGCGTC
721 CCGAACTCGC CGTTCCCGGT TTAATCTCTC GGCTAGACGC CGACGAGGTT ATGAGCGGGA
781 ATCGTGAAGA GACTCTTGAT TTGGTCGACC GTGCTTTAGC TAAATCGGTT CAAATCGTCG
841 TGATTGATGG CGGAGCCACC GCTGGTAAGC TCTACGAGGC GGCTTGTGTTG CTGAAATCAC
901 TTGTCAAAGG CCGTGCTTAC CTCTTGATCG CTGAACGTGT TGATATCGCC TCCGCCGTTG
961 GTGCTAGTGG TGTGCTCTC TCCGACGAAG gtaacaactg atttcattca gtttttagcat
1021 ttaatthtctc atagagttag ttttgtctct caatgctatg tacagGTCTT CCGGCGATTG
1081 TGGCGAGAAA CACATTGATG GGATCCAACC CCGACTCGGT ACTTCTTCCA CTGGTAGCTC
1141 GGATTGTGAA GGATGTTGAT TCTGCTCTAA TTGCCTCAAG CTCCGAGGGT GCTGATTTCC
1201 TTATACTTGG ATCTGGTGAA GAAGATACGC AAGTGGCGGA TTCTTTGTTG AAGAGCGTGA
1261 AAATACCGAT ATATGTGACT TGCAGAGGCA ATGAAGAAGC TAAAGAAGAA TTGCAGTTAC
1321 TGAAATCAGG TGTTTCTGGT TTTGTTATTT CGTTGAAAGA TTTGCGTTCT TCTAGGGATG
1381 TAGCTCTTCG CCAGAGTCTT GATGGAGCTT ATGTTGTAAA TAATCATGAG ACACAAAATA
1441 TGAATGAACT GCCGGAGAAA AAGAAATCTG CTGGCTTCAT AAAATTAGAG GACAAACAGA
1501 AACTAATAGT AGAAATGGAG AAATCTGTGT TGAGAGAGAC GATTGAAATC ATCCACAAGG
1561 CGGCTCCACT Ggtgattttt atttcaaaca tttggtagtt gaagtcaatt ttttgaaatg
1621 gttctaagta ggtttttgtg tggttataat atggtttcat ttacttcttc gactattttt
1681 cattaacagA TGGAGGAAGT CTCCCTTCTA ATTGATGCTG TTTCTCGGAT CGATGAGCCG
1741 TTTCTGATGG TTATAGTGgt aattctgcac tcaactccgt caaattgtga ttccaggaat
1801 ttgcattggt attagctcta tattcattcc agaaacattt tagttacaca cttttgccag
1861 cactagatag cttgagatac aatgggcatg cttctagtca cttgtccttt agtgcttctc
1921 aatatcttct ttcgtcgcct atgactatga gttttcgctt cttcttttgt tctgtctatg
1981 cttctcttct taatttgctt atggatctgg ttgtaaggga actgcatatt tcttaactgt
2041 accatctgct tgtgtacata gttttttcgc tttcttgtga cttgtgagta tgccgttctt
2101 ggaagatggt ttaagtggga caagtgcct ttatgattca aaatagtttt tgtatggata
2161 attaatggga atccacaatt tgctggtagt agGGGGAATT TAACTCTGGA AAATCAACGG
2221 TTATCAATGC ACTTCTTGGG AAGAGATACC TGAAAGAAGG GGTAGTCCCC ACTACCAATG
2281 AAATCACGTT TCTGTGCTAC TCTGACTTGG AATCCGAAGA GCAACAACGT TGCCAAACAC
2341 ATCCAGATGG CCAATATGTA TGCTATCTTC CTGCACCAAT ACTTAAGGAT gtgagtaatt
2401 caaaattcta ccatcgagc cctgaatttt tactaattat ttggaggaat tgatttggtt
2461 tgttctcctt tcgagcagAT AAATATTGTT GACACACCTG GGACCAATGT GATCCTTCAA
2521 AGGCAACAGC GTCTTACAGA AGAATTTGTT CCACGTGCAG ATTTGCTTGT TTTTGTTCCT
2581 TCTGCTGACC GCCCTTTAAC TGAAAGTGAG gtagaagtta ccgtttttact tggcatgtta
2641 gttgttggtt tttttgctca atatgtatct gcctaagtag cttgttagat ctatttttca
2701 cgaaagtagt tagttaagtc atgtatagac catcaagacc ttgtgtaggg aagggaaggt
2761 tgctactagg ttgaatgcat atatcaaggt tttgttgatt ataaatthta actagactaa
2821 tttattttca aagtaatgag tgttatagct attgctggaa ccagtatgtc ctggttggtc
2881 atattttggt aaagcttagg ccaatacatt tgagaggtga gttgttattg gtacagcaaa
2941 actgatttta cgtccatggc aaattgtatg taaatgatca tctacgaagt actaacctta
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Fig. 17, continued 2/2

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3001 tgaatatttg gttcttattt tgaaaatctg aaaaagtttc aaaagaagga ataagcttct
3061 caatgtcatc atacccatgt catttctatc tctacctctg gagcttcctg ctgtcttgat
3121 tttactgtag gctgatttac atctcattgc gtttgtcagG TTGCGTTTCT CCGGTACACA
3181 CAGCAGTGGA AAAAGAAATT TGTGTTTATT CTGAATAAAT CTGATATCTA TCGTGATGCT
3241 CGTGAGgttt atcagaaaca atatttatgt cttttccttg atagtctctg taattgctgg
3301 atttttcttg actaaagatt aattttactg ctgcagCTTG AGGAAGCTAT TTCATTTGTT
3361 AAAGAGAATA CACGGAAGTT GCTTAATACA GAAAATGTGA TATTGTATCC GGTGTCCGCA
3421 CGGTCTGCTC TTGAGGCGAA GCTTTCAACA GCTTCTTTGG TTGGCAGAGA TGATCTTGAG
3481 ATCGCAGATC CTGGTTCTAA TTGGAGAGTC CAGAGCTTCA ATGAACTTGA GAAATTTCTT
3541 TATAGCTTCT TGGATAGCTC AACAGCTACC GGGATGGAGA GAATAAGGCT TAAATTGGAG
3601 ACACCCATGG CGATTGCTGA GCGTCTCCTT TCTTCTGTGG AAGCTCTTGT GAGACAAGAT
3661 TGCCTAGCTG CTAGGGAAGA CTTGGCTTCA GCAGACAAGA TTATCAGTCG AACTAAAGAA
3721 TACGCGCTTA AGATGGAATA TGAGAGCATT TCTTGGAGAA GGCAGGCTCT CTCGTTGGTA
3781 TAAattctat tagatattat cttgttgaat cacgaaggag gaaattggat tgttctaact
3841 tggctttttt gtgttttgta ctctggcttt tatcgcagat tgataatgcc agattacaag
3901 ttgttgatct gataggaact accctgcgac tatcaagcct tgatcttgcg atctcgtacg
3961 tgttcaaagg ggaaaaatcg gcctcagtag cagctacatc caaagttcaa ggtgaaatac
4021 tcgctccagc actcacaaat gcgaaagtaa gtgtgatgct ttattctttg agtattggcc
4081 taactgggga catgttggtc atatatatga ggtctgagat atagtcacta ttcatgcaga
4141 aagtaaatat tgtctaacaa tgtcttggtg tgacctgatt gactttacat ttcactgttt
4201 gcaggaattg cttggaaaat atgctgaatg gctacaatca aatactgccc gtgaaggagg
4261 tctgtctctg aaatcattcg aaa

```

Fig. 18

SEQ ID NO:20

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1  ATGAGAACTC TAATCTCTCA CCGGCAATGT GTGACGTCAC CGTTTCTTAT CTCCGCCGCA
61  TCTCCACCGT TTCCTGGCCG GTGCTTTAAG TTATCCTCCT TTAATCCTCC ACGTCATAGG
121 CGTTTTTCTT CTCTCTCGAT CAGAAACATT TCGCATGAAT CCGCCGATCA GACTTCTTCT
181 TCTAGGCCGC GAACTCTTTA TCCTGGTGGT TACAAGCGTC CCGAACTCGC CGTTCCCGGT
241 TTAATTCTCC GGCTAGACGC CGACGAGGTT ATGAGCGGGA ATCGTGAAGA GACTCTTGAT
301 TTGGTCGACC GTGCTTTAGC TAAATCGGTT CAAATCGTCG TGATTGATGG CGGAGCCACC
361 GCTGGTAAGC TCTACGAGGC GGCTTGTTTG CTGAAATCAC TTGTCAAAGG CCGTGCTTAC
421 CTCTTGATCG CTGAACGTGT TGATATCGCC TCCGCCGTTG GTGCTAGTGG TGTTGCTCTC
481 TCCGACGAAG GTCTTCCGGC GATTGTGGCG AGAAACACAT TGATGGGATC CAACCCCGAC
541 TCGGTACTTC TTCCACTGGT AGCTCGGATT GTGAAGGATG TTGATTCTGC TCTAATTGCC
601 TCAAGCTCCG AGGGTGCTGA TTTCTTATA CTTGGATCTG GTGAAGAAGA TACGCAAGTG
661 GCGGATTCTT TGTTGAAGAG CGTGAAAATA CCGATATATG TGACTTGCAG AGGCAATGAA
721 GAAGCTAAAG AAGAATTGCA GTTACTGAAA TCAGGTGTTT CTGGTTTTGT TATTTCTGTTG
781 AAAGATTTGC GTTCTTCTAG GGATGTAGCT CTTGCCCAGA GTCTTGATGG AGCTTATGTT
841 GTAAATAATC ATGAGACACA AAATATGAAT GAACTGCCGG AGAAAAAGAA TTCTGCTGGC
901 TTCATAAAAT TAGAGGACAA ACAGAAACTA ATAGTAGAAA TGGAGAAATC TGTGTTGAGA
961 GAGACGATTG AAATCATCCA CAAGGCGGCT CCACTGATGG AGGAAGTCTC CCTTCTAATT
1021 GATGCTGTTT CTCGGATCGA TGAGCCGTTT CTGATGGTTA TAGTGGGGGA ATTTAACTCT
1081 GGAAAATCAA CGGTTATCAA TGCACTTCTT GGGAAGAGAT ACCTGAAAGA AGGGGTAGTC
1141 CCCACTACCA ATGAAATCAC GTTTCTGTGC TACTCTGACT TGGAATCCGA AGAGCAACAA
1201 CGTTGCCAAA CACATCCAGA TGGCCAATAT GTATGCTATC TTCCTGCACC AATACTTAAG
1261 GATATAAATA TTGTTGACAC ACCTGGGACC AATGTGATCC TTCAAAGGCA ACAGCGTCTT
1321 ACAGAAGAA TTTGTTCCACG TGCAGATTTG CTTGTTTTTG TTCTTTCTGC TGACCGCCCT
1381 TTAAGTAAA GTGAGGTTGC GTTTCTCCGG TACACACAGC AGTGGAAGAA GAAATTTGTG
1441 TTTATTCTGA ATAAATCTGA TATCTATCGT GATGCTCGTG AGCTTGAGGA AGCTATTTCA
1501 TTTGTTAAAG AGAATACACG GAAGTTGCTT AATACAGAAA ATGTGATATT GTATCCGGTG
1561 TCCGCACGGT CTGCTCTTGA GGCGAAGCTT TCAACAGCTT CTTTGGTTGG CAGAGATGAT
1621 CTTGAGATCG CAGATCCTGG TTCTAATTGG AGAGTCCAGA GCTTCAATGA ACTTGAGAAA
1681 TTTCTTTATA GCTTCTTGGA TAGCTCAACA GCTACCGGGA TGGAGAGAAT AAGGCTTAAA
1741 TTGGAGACAC CCATGGCGAT TGCTGAGCGT CTCCTTTCTT CTGTGGAAGC TCTTGAGAGA
1801 CAAGATTGCC TAGCTGCTAG GGAAGACTTG GCTTCAGCAG ACAAGATTAT CAGTCGAACT
1861 AAAGAATACG CGCTTAAGAT GGAATATGAG AGCATTCTT GGAGAAGGCA GGCTCTCTCG
1921 TTGGTATAA

```

Fig. 19

SEQ ID NO:21

MRTLISHRQC VTSPFLISAA SPPFPGRCFK LSSFTPPRHR RFSSLSIRNI SHESADQTSS
SRPRTLYPGG YKRPELAVPG LLLRLDADEV MSGNREETLD LVDRALAKSV QIVVIDGGAT
AGKLYEAACL LKSLVKGRAY LLIAERVDIA SAVGASGVAL SDEGLPAIVA RNTLMGSNPD
SVLLPLVARI VKDVDSALIA SSSEGADFLI LGSGEEDTQV ADSLLKSVKI PIYVTCRGNE
EAKEELQLLK SGVSGFVISL KDLRSSRDVA LRQSLDGAYV VNNHETQNMN ELPEKKNSAG
FIKLEDKQKL IVEMEKSVLR ETIEIIHCAA PLMEEVSLLI DAVSRIDEPF LMVIVGEFNS
GKSTVINALL GKRYLKEGVV PTTNEITFLC YSDLESEEQQ RCQTHPDGQY VCYLPAPILK
DINIVDTPGT NVILQRQORL TEEFVPRADL LVFVLSADRP LTESEVAFLR YTQQWKKKFV
FILNKSDIYR DARELEEAIIS FVKENTRKLL NTENVILYPV SARSALEAKL STASLVGRDD
LEIADPGSNW RVQSFNELEK FLYSFLDSST ATGMERIRLK LETPMAIAER LLSSVEALVR
QDCLAAREDL ASADKIISRT KEYALKMEYE SISWRRQALS LV

Fig. 20

SEQ ID NO:22

```
1  actgtcacaa agaactagaa aaggcaagca aaactcaact atgtcaaaag tgtcacttag
61  attgattctt gaatagcgag acgaagtatc tgggaaaata cgggtactgaa ttaacatctc
121 cgtcagatca taggttcgga ttgaacagat gacacaatta aacaatgatg aagatcaaga
181 cactttaatc gactgaattc tagttagaac ttagactaaa agtattttaat acttgaagct
241 caccacttct cgaatatctt gttccaatcg ttttgatgtg gttccggcac tcaagttctg
301 tattgttttc aagctgactt tatcagtttt ctgaagtaag tcatatgtgt ctatgccccaa
361 ttgcgttttt gaattgacat atgttgggca tttgttttcg aatgatttca gagacagact
421 cccttcacgg gcagtatttg attgtagcca ttcagcatat tttccaagca attcctgcaa
481 acagtgaaat gtaaagtcaa tcaggtcaca acaagacatt gttagacaat atttactttc
541 tgcattgaata gtgactatat ctgagacctc atatatatga ccaacatgtc ccagtttagg
601 ccaatactca aagaataaag catcacactt actttcgcac ttgtgagtgc tggagcgagt
661 atttcacctt gaactttgga tgtagtgtgt actgaaggcg atttttcccc tttgaacacg
721 tacgagatcg caagatcaag gcttgatagt cgcagggtag ttcctatcag atcaacaact
781 tgtaatctgg cattatcaat ctgcgataaa agccagagta caaaacacaa aaaagccaag
841 ttagaacaat ccaatttctt ccttcgtgat tcaacaagat aatatctaata agaatttata
901 ccaacgagag agcctgcctt ctccaagaaa tgctctcata ttcctatcta agcgcgtatt
961 ctttagttcg actgataatc ttgtctgtcg aagccaagtc ttccttagca gctaggcaat
1021 cttgtctcac aagagcttcc acagaagaaa ggagacgctc agcaatcgcc atgggtgtct
1081 ccaattttaag ccttattctc tccatcccg tagctgttga gctatccaag aagctataaaa
1141 gaaatttctc aagttcattg aagctctgga ctctccaatt agaaccagga tctgcatctc
1201 caagatcadc tctgccaacc aaagaagctg ttgaaagctt cgctcaaga gcagaccgtg
1261 cggacaccgg atacaatadc acattttctg tattaagcaa ctccgtgta ttctctttaa
1321 caaatgaaat agcttctca agctgcagca gtaaaattaa tctttagtca agaaaaatcc
1381 agcaattaca gagactatca aggaaaagac ataaatattg tttctgataa acctcacgag
1441 catcacgata gatatcagat ttattcagaa taaacacaaa tttctttttc cactgctgtg
1501 tgtaccggag aaacgcaacc tgacaaacgc aatgagatgt aaatcagcct acagtaaaat
1561 caagacagca ggaagctcca gaggtagaga tagaaatgac atgggtatga tgacattgag
1621 aagcttattc cttcttttga aactttttca gattttcaaa ataagaacca aatattcata
1681 aggttagtac ttcgtagatg atcattttaca tacaatttgc catggacgta aaatcagttt
1741 tgctgtacca ataacaactc acctctcaaa tgtattggcc taagctttac caaaatatgg
1801 accaacagga catactgggt ccagcaatag ctataacact cattactttg aaaataaatt
1861 agtctagttt aaatttataa tcaacaaaac cttgatatat gcattcaacc tagtgacaac
1921 tttcccttcc ctacacaagg tcttgatggg ctatacatga cttaactaac tactttcgtg
1981 aaaaatagat ctaacaagct acttaggcag atacatattg agcaaaaaca acaacaacta
2041 acatgccaa gtaaaacggt aactctacct cactttcagt taaagggcgg tcagcagaaa
2101 gaacaaaaac aagcaaatct gcacgtggaa caaattcttc tgtaagacgc tgttgccttt
2161 gaaggatcac attggtccca ggtgtgtcaa caatatttat ctgctcgaaa ggagaacaac
2221 ccaaatcaat tctccaaat aattagtaaa aattcaggac tgcatgggta gaattttgaa
2281 ttactcacat ccttaagtat tgggtgcagga agatagcata catattggcc atctggatgt
2341 gtttggaac gttgttgctc ttccgattcc aagtcagagt agcacagaaa cgtgatttca
2401 ttggtagtgg ggactacccc ttctttcagg tatctcttcc caagaagtgc attgataacc
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2521 tccatacaaa aactattttg aatcataaag gcaacttgct ccacttaaaa catcttccaa
2581 gaacggcata ctcaacagtc acaagaaagc gaaaaaacta tgtacacaag cagatggtac
2641 agttaagaaa tatgcagttc ccttacaacc agatccataa gcaaattaag aagagaagca
2701 tagacagaac aaaagaagaa gcgaaacatc atagtcatag gcgacgaaag aagatattga
2761 gaagcactaa aggacaagtg actagaagca tgcccattgt atctcaagct atctagtgtc
2821 ggcaaaagtg tgtaactaaa atgtttctgg aatgaatata gagctaatac caatgcaaat
2881 tcctggaatc acaatttgac ggagttgagt gcagaattac cactataacc atcagaaacg
2941 gctcatcgat ccgagaaaca gcatcaatta gaaggagac ttcctccatc tgtaaatgaa
```

Fig. 20, continued 2/2

3001	aaatagtcga	agaagtaa	gaaaccatat	tataaccaca	caaaaaccta	cttagaacca
3061	tttcaaaaaa	ttgacttcaa	ctaccaaatg	tttgaaataa	aatcaccag	tgagagccgc
3121	ttgtggatga	tttcaatcgt	ctctctcaac	acagatttct	ccatttctac	tattagtttc
3181	tgtttgcct	ctaattttat	gaagccagca	gaattctttt	tctccggcag	ttcattcata
3241	ttttgtgtct	catgattatt	tacaacataa	gctccatcaa	gactctggcg	aagagctaca
3301	tccctagaag	aacgcaa	tttcaacgaa	ataacaaaac	cagaaacacc	tgatttccagt
3361	aactgcaatt	cttcttttagc	ttcttcattg	cctctgcaag	tcacatatat	cggatttttc
3421	acgctcttca	acaaagaatc	cgccacttgc	gtatcttctt	caccagatcc	aagtataagg
3481	aaatcagcac	cctcggagct	tgaggcaatt	agagcagaat	caacatcctt	cacaatccga
3541	gctaccagtg	gaagaagtac	cgagtcgggg	ttggatccca	tcaatgtgtt	tctcgccaca
3601	atcgccggaa	gacctgtaca	tagcattgag	agacaaaact	cactctatga	gaaattaaat
3661	gctaaaactg	aatgaaatca	gttgttacct	tcgtcggaga	gagcaacacc	actagcacca
3721	acggcggagg	cgatatcaac	acgttcagcg	atcaagaggt	aagcacggcc	tttgacaagt
3781	gatttcagca	aacaagccgc	ctcgtagagc	ttaccagcgg	tggtctcgcc	atcaatcacg
3841	acgatttgaa	ccgatttagc	taaagcacgg	tcgaccaa	caagagtctc	ttcacgattc
3901	ccgctcataa	cctcgtcggc	gtctagccgg	agaagtaa	cgggaacggc	gagttcggga
3961	cgcttgtaac	caccaggata	aagagtctgc	ggcctagaag	aagaagtctg	atcgccggat
4021	tcatgcgaaa	tgtttctgat	cgagagagaa	gaaaaacgcc	tatgacgtgg	aggagttaa
4081	gaggataact	taaagcaccg	gccaggaa	ggtggagatg	cggcggagat	aagaaacggt
4141	gacgtcacac	attgccggtg	agagattaga	gttctcatgg	agagagaaa	agagagagtg
4201	agataccttc	gtctgtgttt	ctgattagtt	ttcttatctc	ttaaatatcc	tattggccca
4261	tcccaaagct	ataagacgga	cggcgcgatt	aaattacttt	caaacacatg	aattaacggt
4321	ttcacatatg	tgttcatatc	caaaaggtcc	aaagtatacc	acgaaaaggg	agaaaaacag
4381	atttaaattc	gtgaaatccc	tctcccacaa	ttaaatttac	ttcttccaaa	caaagacaaa
4441	cggcttgaac	cagtcaagta	agtgatacgg	caccactaga	tgttccagag	cctccatctt
4501	ttttaatacg	aagaagattt	gtcctttgtg	tgtatgaatt	taacaagttt	taattataga
4561	tttgtgtgtg	tatgaattta	aaaacctagt	acgtagcatc	agggaaatgat	atcatagcta
4621	ttttagttga	gctttcaa	aagagatgat	caaaatttag	aacttctaag	aacatgaacg
4681	aataaacaac	tattttcttt	tcaaaccaac	taaggtagat	ggtcactgaa	agtatataca
4741	tcagataaaa	gttgcttgtt	attccagatg	aagttggacc	gagaaaaaaa	aaagttactt
4801	gttattcaat	atgtttggat	ctttgtcttg	cagattgcta	tatagggttg	ataatgggct
4861	tcgtttgaat	gggtatacag	tgtataagaa	tcggccttgt	gcaaccaatc	ctaatatgtg
4921	tgtctcatta	aggtaagtgc	ttaagattag	aagagtaaaa	cacttgactt	atcaactatg
4981	tcaactaagg	gttctatatt	tttattaaat	aaaaaataat	tgaatatatt	ttagaatgat
5041	ttaataaatt	taatgctatt	gtttgattta	aatgtataat	tcaccgcgag	aagaaatttt
5101	ataactcaa	ttttaagtt	ttaagttgta	tttgtttatt	ttgttaa	tttaatatg
5161	tataattgta	ttttgattgt	tgtttctcgg	atttcacccg	tagtacatca	tcccatatta
5221	atatacgaatc	aaacccgtca	attctaaaa	ttcaccogtg	gtagtattta	attgtataat
5281	tatattttaa	ttgtcattct	aagatttcac	tcctaattct	atcgcaaatt	attatcaacc
5341	caaaccagtc	aattctaaaa	tatcaccogt	agtacaccat	cccatattaa	tatcgaatca
5401	agcccgta	ttctaggatt	tcaccogtgg	tagtatttaa	ttgtataatt	atattttaat
5461	tgtcattcta	ggatttcact	cctaattcta	tcgcaaatta	ttatcaaccc	aaaccagtc
5521	attctaaaa	atcaccogta	gtacaccatc	ccatattaat	atcgattcaa	actcgta
5581	tctaggattt	cgctcgtgg	agtattta	tgtataatta	tatttta	gtcattttta
5641	ctcctagttc	tatcgcaat	tcttatcaac	ccaaacagtc	aattctaaaa	tttcacccgt
5701	agtataaagt	ttaaatattt	ataatattta	aatttcttat	aaaagaatca	aaatgtgttt
5761	taaaaaaatt	aaagttttta	gttttttttt	tttaatatg	tttaatttgt	ttagtgttta
5821	agattatata	attacattat	gattgtcatt	atatgttttt	ctccatagca	tactatccca
5881	tgttattatc	cactcaaacc	tgtcacacca	tataaccccg	tcccgta	ttaaacacaa
5941	atttgtcatt	ttattataaa	tttcaa	ttataaa	agaaacttca	aaaaagatta
6001	atattgaccc	aaacttcac	attgaatttt	gagtgttata	tctaagattt	ctctcgcaat

Fig. 21

SEQ ID NO:23

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1 atggaggctc tggaaacatct agtgcttttg gatgggcca taggatattt aagagataag
61 aaaactaatc agaaacacag acgaaggat ctcactctct ctctttctct ctccatgaga
121 actetaatct ctcaccggca atgtgtgacg tcaccgtttc ttatctccgc cgcactctcca
181 ccgtttcttg gccggtgctt taagttatcc tcctttactc ctccacgtca taggcgtttt
241 tcttctctct cgatcagaaa catttcgcat gaatccgccg atcagacttc ttcttctagg
301 ccgogaactc tttatctctg tggttacaag cgtcccgaac tcgccgttcc cggtttactt
361 ctccggctag acgccgacga gggtatgagc gggaaatcgtg aagagactct tgatttggtc
421 gaccgtgctt tagctaaatc gggtcaaatc gtcgtgattg atggcggagc caccgctggt
481 aagctctacg aggcggttg tttgctgaaa tcacttgta aaggccgtgc ttacctcttg
541 atcgtgaac gtgttgatat cgctccgcc gttggtgcta gtggtgttg ctcctccgac
601 gaaggctctc cggcgattgt ggcgagaaac acattgatgg gatccaacc cgcactcgga
661 cttcttccac tggtagctcg gattgtgaag gatgttgatt ctgctctaat tgctcaagc
721 tccgaggggtg ctgatttctt tatacttgga tctggtgaag aagatacgca agtggcggat
781 tctttgttga agagcgtgaa aataccgata tatgtgactt gcagaggcaa tgaagaagct
841 aaagaagaat tgcagttact gaaatcaggt gttcttggtt ttgttatttc gttgaaagat
901 ttgcgttctt ctagggtgt agctcttcgc cagagtcttg atggagctta tgtgttaaat
961 aatcatgaga caaaaatat gaatgaactg ccggagaaaa agaattctgc tggcttcata
1021 aaattagagg acaaacagaa actaatagta gaaatggaga aatctgtgtt gagagagacg
1081 attgaaatca tccacaaggc ggctccactg atggaggaag tctcccttct aattgatgct
1141 gtttctcgga tcgatgagcc gtttctgatg gttatagtgg gggaaattta ctctgaaaa
1201 tcaacggtta tcaatgcact tcttggaag agatacctga aagaaggggt agtccccact
1261 accaatgaaa tcacgtttct gtgctactct gacttggaat ccgaagagca acaacgttgc
1321 caaacacatc cagatggcca atatataaat attgttgaca cacctgggac caatgtgatc
1381 cttcaaaggc aacagcgtct tacagaagaa tttgtccac gtgcagattt gcttgttttt
1441 gttctttctg ctgaccgccc tttactgaa agtgaggtag aagttaccgt tttacttggc
1501 atggaaggga aagttgtcac taggttgaat gcatatatca aggttgcggt tctccggtac
1561 acacagcagt ggaaaaagaa atttgtgttt attctgaata aatctgatat ctatcgtgat
1621 gctcgtgagc ttgaggaagc tatttcattt gttaaagaga atacacggaa gttgcttaat
1681 acagaaaatg tgatattgta tccggtgtcc gcacggctct ctcttgaggc gaagctttca
1741 acagcttctt tggttggcag agatgatctt gagatcgag atcctgggtc taattggaga
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1861 accgggatgg agagaataag gcttaaattg gagacacca tggcgattgc tgagcgtctc
1921 ctttcttctg tggagctct tgtgagacaa gattgcctag ctgctaggga agacttggct
1981 tcagcagaca agattatcag tcgaactaaa gaatacgcgc ttaagatgga atatgagagc
2041 atttcttgga gaaggcaggc tctctcggtt attgataatg ccagattaca agttgttgat
2101 ctgataggaa ctaccctgcg actatcaagc cttgatcttg cgatctcgta cgtgttcaaa
2161 ggggaaaaat cggcctcagt agcagctaca tccaaagttc aagggtgaaat actcgtccca
2221 gcaactacaa atgcgaaaga attgcttgga aaatatgctg aatggctaca atcaaatact
2281 gcccgtaag ggagtctgtc tctgaaatca ttcgaaaaca aatggccaac atatgtcaat
2341 tcaaaaacgc aattgggcat agacacatat gacttacttc agaaaactga taaagtcagc
2401 ttgaaaacaa tacagaactt gagtgcgga accacatcaa aacgattgga acaagatatt
2461 cgagaagtg
```

Fig. 22

SEQ ID NO:24

MEALEHLVLWDGPIGYLRDKKTNQKHRRRYLTLSLSLSMRTLISHRQCVTSPFLISAASPPFPGRCKFLSS
FTPPRHRRFSSLSIRNISHESADQTSSSRPRTLYPGGYKRPELAVPGLLLRLDADEVMSGNREETLDLVDR
ALAKSVQIVVIDGGATAGKLYEAACLLKSLVKGRAYLLIAERVDIASAVGASGVALSDEGLPAIVARNTLM
GSNPDSVLLPLVARIVKDVDLSALIASSEGADFLILGSGEEDTQVADSLKSVKIPIYVTCRGNEEAKEEL
QLLKSGVSGFVISLKDRLSSRDVALRQSLDGAYVNNHETQNMNELPEKKNSAGFIKLEDKQKLIVEMES
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Fig. 23

SEQ ID NO:25

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Fig. 24

AtFzo-like Genomic Sequence

From

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F10O3, AC006550:

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Fig. 24 continued 2/3

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Fig. 24 continued 3/3

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FIG. 26

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Cichorieae; Lactuca.
REFERENCE 1 (bases 1 to 712)
AUTHORS Kozik,A., Micheltmore,R.W., Knapp,S., Matvienko,M., Rieseberg,L.,
Lin,H., van Damme,M., Lavelle,D., Chevalier,P., Ziegler,J., Ellison
,P., Kolkman,J., Slabaugh,M.S., Livingston,K., Zhou,Y., Lai,Z.,
Church,S., Jackson,L. and Bradford,K.
TITLE Lettuce and Sunflower ESTs from the Compositae Genome Project
http://compgenomics.ucdavis.edu/
JOURNAL Unpublished
COMMENT Contact: Alexander Kozik [R.W.Micheltmore]
Department of Vegetable Crops, R.W.Micheltmore Lab
University of California at Davis (UCD)
Asmundson Hall, UCD, Davis, CA 95616, USA
Tel: 1-(530)-742-1742
Fax: 1-(530)-752-9659
Email: akozik@atgc.org [micheltmore@vegmail.ucdavis.edu]
singleton, see http://cgpdb.ucdavis.edu/
for
details.
Plate: QGC17 row: C column: 24.
FEATURES Location/Qualifiers

Fig. 26 continued 2/9

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Fig. 26 continued 3/9

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=yes,toolbar=no,location=no,directories=no,status=no,menubar=no,copyhistory=no,width=40
0,height=500');", "", "", ""]
]
//-->
</SCRIPT>
<A class=dblinks
href="javascript:PopUpMenu2_Set(Menu13371119,"","", "");"

target=_self>Links</A></SPAN></TD></TR></TBODY></TABLE></DT></DL><PRE>L
OCUS   BG452325
666 bp  mRNA  linear  EST 16-MAR-2001
DEFINITION  NF086D06LF1F1047 Developing leaf Medicago truncatula cDNA clone
           NF086D06LF 5', mRNA sequence.
ACCESSION  BG452325
VERSION    BG452325.1 GI:13371119
KEYWORDS   EST.
SOURCE     Medicago truncatula (barrel medic)
ORGANISM   <A href="
http://www.ncbi.nlm.nih.gov/htbin-
post/Taxonomy/wgetorg?name=Medicago+truncatula">Medicago
truncatula</A>
           Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
           Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; rosids
           ; eurosids I; Fabales; Fabaceae; Papilionoideae; Trifolieae;
           Medicago.
REFERENCE  1 (bases 1 to 666)
AUTHORS   Torres-Jerez,I., Scott,A.D., Harris,A.R., Gonzales,R.A., Bell,C.J.,
           Flores,H.R., Inman,J.T., Weller,J.W. and May,G.D.
TITLE     Expressed Sequence Tags from the Samuel Roberts Noble Foundation
           Medicago truncatula leaf library
JOURNAL   Unpublished
COMMENT   Contact: May GD
           Plant Biology Division
           The Samuel Roberts Noble Foundation
           2510 Sam Noble Parkway, Ardmore, OK 73402, USA
           Tel: 580 221 7391
           Fax: 580 221 7380
           Email: <A href="mailto:gdmay@noble.org">gdmay@noble.org</A>
```

Fig. 26 continued 4/9

```

Insert Length: 666 Std Error: 0.00
Plate: 086 row: D column: 06
Seq primer: TCACACAGGAAACAGCTATGAC.
FEATURES             Location/Qualifiers
    source             1..666
                        /organism="Medicago truncatula"
                        /mol_type="mRNA"
                        /db_xref="<A href="
http://www.ncbi.nlm.nih.gov/htbin-post/Taxonomy/wgetorg?id=3880">taxon:3880</A>"
                        /clone="NF086D06LF"
                        /tissue_type="leaf"
                        /dev_stage="Pooled developmental"
                        /clone_lib="Developing leaf"
                        /note="Vector: Lambda Zap; Contains a mixture of very
young, developing, mature and senescing leaves."
BASE COUNT   201 a  163 c  147 g  154 t   1 others
ORIGIN
    1 atctaaagta acaaccacca caaaacacaa caatggagga agaaagagaa caccaccaac
    61 tcaaagacaa agaagaaaac gagtggcgtc tctacgaagc ttacaatgaa cttcacgcgc
   121 ttgctcaaga acttcacacg ccttcgacg cgccggcggg actggttggt gccacacaa
   181 cagacgggaa gagcgcctta gttgaggctc taatgggctt ccagttcaac cagtcgggtg
   241 gtggcaccac aaccgcggcg ccattactc ttacatgaa atatggccca cattgcgagt
   301 ctctcttctg ctatcttctt tctgatgatg acccttctct ttctacccat atgtcacttt
   361 cccaaatcca gggttatatt gaagctgaga atgcgagggt ggagcgtgac tcatgttgtc
   421 aattttcagc taaggaaata atcataaaag tggaatacaa atactgtccc aatcacca
   481 taatagacac accaggatta gttgctcctg caccaggctg taaaaatagg gcgatacagg
   541 cacaggcacg agcggtagag tcaactgttc gtgcaaaaat gcagcacaag gagttcatta
   601 tactctgtct tgaagattgt agtgattgga gcaatgcgac tacgangcgc gttgtaatgc
   661 aaattg

//
</PRE>
<DL>
  <DT>
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          <TD><INPUT type=checkbox value=14878353 name=uid><B>3: </B>BI270606.
            NF056G04FL1F1036 ...[gi:14878353] </TD>
          <TD align=right><SPAN>
            <SCRIPT language=JavaScript1.2>
              <!--
              var Menu14878353 = [

["Taxonomy","window.top.location='/entrez/query.fcgi?db=nucleotide&cmd=Display&dopt=
nucleotide_taxonomy&from_uid=14878353'", "", ""],

```

Fig. 26 continued 5/9

```
["Help","window.open('/entrez/query/static/popup.html','Links_Help','resizable=no,scrollbars
=yes,toolbar=no,location=no,directories=no,status=no,menubar=no,copyhistory=no,width=40
0,height=500');","",""]
]
//-->
</SCRIPT>
<A class=dblinks
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target=_self>Links</A></SPAN></TD></TR></TBODY></TABLE></DT></DL><PRE>L
OCUS    BI270606
663 bp  mRNA  linear  EST 18-JUL-2001
DEFINITION  NF056G04FL1F1036 Developing flower Medicago truncatula cDNA clone
            NF056G04FL 5', mRNA sequence.
ACCESSION  BI270606
VERSION    BI270606.1 GI:14878353
KEYWORDS   EST.
SOURCE     Medicago truncatula (barrel medic)
ORGANISM   <A href="
http://www.ncbi.nlm.nih.gov/htbin-
post/Taxonomy/wgetorg?name=Medicago+truncatula">Medicago
truncatula</A>
            Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
            Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; rosids
            ; eurosids I; Fabales; Fabaceae; Papilionoideae; Trifolieae;
            Medicago.
REFERENCE  1 (bases 1 to 663)
AUTHORS   Torres-Jerez,I., Scott,A.D., Harris,A.R., Gonzales,R.A., Bell,C.J.,
            Flores,H.R., Inman,J.T., Weller,J.W. and May,G.D.
TITLE     Expressed Sequence Tags from the Samuel Roberts Noble Foundation
            Medicago truncatula flower library
JOURNAL   Unpublished
COMMENT   Contact: May GD
            Plant Biology Division
            The Samuel Roberts Noble Foundation
            2510 Sam Noble Parkway, Ardmore, OK 73402, USA
            Tel: 580 221 7391
            Fax: 580 221 7380
            Email: <A href="mailto:gdmay@noble.org">gdmay@noble.org</A>
            Insert Length: 663 Std Error: 0.00
            Plate: 056 row: G column: 04
            Seq primer: TCACACAGGAAACAGCTATGAC.
FEATURES   Location/Qualifiers
            source          1..663
                        /organism="Medicago truncatula"
                        /mol_type="mRNA"
```

Fig. 26 continued 6/9

```

/db_xref="<A href="
http://www.ncbi.nlm.nih.gov/htbin-post/Taxonomy/wgetorg?id=3880">taxon:3880</A>"
/clone="NF056G04FL"
/tissue_type="Developing flowers"
/dev_stage="Developmentally pooled. Contains a mixture of
very young, developing, fully-opened flowers and flowers
in early transition into pods."
/clone_lib="Developing flower"
/note="Vector: Lambda Zap; cDNA was prepared from polyA+
enriched, pooled samples of equivalent amounts of total
RNA from very young, developing, fully-opened flowers and
flowers transitioning into pods. The cDNA was
directionally ligated into the Uni-Zap XR vector
(Stratagene) and packaged using the Gigapack III Gold
packaging extracts. Phagemids containing cDNA inserts were
in vivo excised from the recombinant Uni-ZAP XR vector
using ExAssist helper phage and the E. coli strain
XL1-Blue MRF' (Stratagene). Excised plasmids were plated
using SOLR cells."

```

BASE COUNT 191 a 141 c 144 g 187 t

ORIGIN

```

1 gcttttatgg ggggtcaca tatcatcgag caatggctga atttcgttt gtagttggag
61 gaatcaagtg cccccaatt acccggaag aaattgtaa tgctgtgga gttgaagaca
121 ttcgatgg acaaaactac tctaggactg ctgtgtaat tgctgtgca aaggctcatg
181 atacattga accttttct catcagttgg ggtctagatt gttgcacata ctaagagat
241 tgctcccaat ctcttttat ctcttcaga aagattgta gtatctaagt ggccatcagg
301 tgttctcag gcgtgtgcc tccgcctcg acaacttgc agaatccact gaaaaatcat
361 gccgtgaaaa atgtatggag gacttggtaa gcaccacag atatgtctca tggctctac
421 acaataagag tcgggcagga ttacgccagt tcttagatc atttggtgga acagaacatt
481 ccaatgttg taatgatccc actgcaactg ttctatcaca acaaatgtg caagagaagg
541 aagacacaaa gccacaacta gaagtaaagc tcagtcacgt ggctctgga actgaccta
601 gcacatccac ccagacagct gaaacaaagc ttgctgacct tcttgatagt acacttgga
661 atc

```

//

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PP_LEa0022H05f Pe...[gi:22485477] </TD>

<TD align=right>

<SCRIPT language=JavaScript1.2>

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Fig. 26 continued 7/9

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```
["Help","window.open('/entrez/query/static/popup.html','Links_Help','resizable=no,scrollbars=yes,toolbar=no,location=no,directories=no,status=no,menubar=no,copyhistory=no,width=400,height=500')", "", ""]
```

```
]
```

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//-->
```

```
</SCRIPT>
```

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<A class=dblinks
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href="javascript:PopUpMenu2_Set(Menu22485477,"","", "");"
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target=_self>Links</A></SPAN></TD></TR></TBODY></TABLE></DT></DL><PRE>L
OCUS   BU045400
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```
622 bp  mRNA  linear  EST 26-AUG-2002
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```
DEFINITION PP_LEa0022H05f Peach developing fruit mesocarp Prunus persica cDNA
clone PP_LEa0022H05f, mRNA sequence.
```

```
ACCESSION BU045400
```

```
VERSION BU045400.1 GI:22485477
```

```
KEYWORDS EST.
```

```
SOURCE Prunus persica (peach)
```

```
ORGANISM <A href="http://www.ncbi.nlm.nih.gov/htbin-
post/Taxonomy/wgetorg?name=Prunus+persica
```

Prunus persica

```
Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; rosids
; eurosids I; Rosales; Rosaceae; Amygdaloideae; Prunus.
```

```
REFERENCE 1 (bases 1 to 622)
```

```
AUTHORS Callahan,A., Palmer,M., Main,D., Wing,R. and Abbott,A.
```

```
TITLE Peach Model Genome for Rosaceae
```

```
JOURNAL Unpublished
```

```
COMMENT Contact: Abbott, A.
```

```
Dept of Genetics and Biochemistry
```

```
Clemson University
```

```
122 Long Hall, Clemson University, Clemson, SC 29634, USA
```

```
Tel: 864 656 3060
```

```
Fax: 864 656 6879
```

```
Email: <A href="mailto:aalbert@clemson.edu">aalbert@clemson.edu</A>
```

```
Total High Quality bases = 553
```

```
Seq primer: TAATACGACTCACTATAGGG
```

```
High quality sequence stop: 622.
```

```
FEATURES Location/Qualifiers
```

```
source 1..622
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/organism="Prunus persica"
```

```
/mol_type="mRNA"
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Fig. 26 continued 8/9

```

/cultivar="Loring"
/db_xref="<A href="
http://www.ncbi.nlm.nih.gov/htbin-post/Taxonomy/wgetorg?id=3760">taxon:3760</A>"
/clone="PP_LEa0022H05f"
/tissue_type="Mesocarp"
/lab_host="E. coli"
/clone_lib="Peach developing fruit mesocarp"
/note="Vector: pBluescript II SK(-); Site_1: EcoRI;
Site_2: XhoI; authority=Prunus persica L. Batsh; The
sequence has been trimmed to remove vector sequence and
contains a minimum of 100 bases of phred value 20 or
above. For more details on library preparation and
sequence analysis go to
<A href="http://www.genome.clemson.edu/projects/peach">
http://www.genome.clemson.edu/projects/peach</A>. To order
this clone go to <A href="http://www.genome.clemson.edu/orders">
http://www.genome.clemson.edu/orders</A>"
BASE COUNT 168 a 125 c 147 g 181 t 1 others
ORIGIN

```

```

1 gcttatacct aacgcaggaa tgcgtttata tgggtggtgca caataccacc gtgccatggc
61 tgagtccgc ttttagttg gaggaataaa atgccctcca attacaaggg aagaaattgt
121 aaatgcatgt ggagtgaag attacatga tggcacaac tactcaagga cagcttgtgt
181 aatagccgtt gcaaaggccc gtgatacatt tgagccttct cttcatcagt taggtttag
241 actcttgac attctaaaga gattactcc tatatcagtc tatcttctc agaaagatgg
301 tgagtattta agtggccatg aggtgtttct taggcgtgtt gcttctgctt tcaatgactt
361 tgcagaatct accgaaaggg catgtcgtga aaaatgcatg gaggatttag taagcaccac
421 ccgctatgtc acctgggtccc ttcacaaca gaatcgagct gggttacgtc aatttttaga
481 ctggttgcgt ggaacagaac ataacactat gggtagtaat tgcgtacctg ctggtatttc
541 ccaagattca tctttgggt ctgttgccaa tgagaaggat actaagtcaa gggcagatgt
601 gaagctcanc catgtggcgt ct

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value=asn>ASN.1</OPTION> <OPTION value=est>EST</OPTION> <OPTION

value=fasta>FASTA</OPTION> <OPTION value=fasta_xml>TinySeq

XML</OPTION> <OPTION value=gb selected>GenBank</OPTION> <OPTION

value=gb_xml>GBSeq XML</OPTION> <OPTION value=gi>GI List</OPTION>

Fig. 26 continued 9/9

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value=xml>XML</OPTION> <OPTION  
value=default>default</OPTION></SELECT></SMALL><SMALL>  
&nbsp;&nbsp; Show:&nbsp;  </SMALL><SELECT  
onchange=form.dispmx.selectedIndex=selectedIndex  
name=dispmx1><OPTION value=1>1</OPTION> <OPTION  
value=2>2</OPTION> <OPTION value=5>5</OPTION> <OPTION  
value=10>10</OPTION> <OPTION value=20 selected>20</OPTION> <OPTION  
value=50>50</OPTION> <OPTION value=100>100</OPTION> <OPTION  
value=200>200</OPTION> <OPTION value=500>500</OPTION></SELECT>  
&nbsp;&nbsp; <INPUT onclick="GoV  
(form.SendTo.options[form.SendTo.selectedIndex].value,4)" type=button value="Send to"  
name="">  
&nbsp;  <SELECT onchange=form.SendTo.selectedIndex=selectedIndex  
name=SendTo1><OPTION value=on selected>File</OPTION> <OPTION  
value=t>Text</OPTION> <OPTION  
value="Add to Clipboard">Clipboard</OPTION></SELECT>  
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value=20 name=showndispmx><INPUT type=hidden value=0  
name=page></TBODY></TABLE></TD></TR></TBODY></TABLE></FORM><BR>  
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<P><A href="http://www.ncbi.nlm.nih.gov/About/disclaimer.html">Disclaimer</A> |  
<A href="mailto:info@ncbi.nlm.nih.gov">Write to the Help Desk</A><BR><A  
href="http://www.ncbi.nlm.nih.gov/">NCBI</A> | <A  
href="http://www.nlm.nih.gov/">NLM</A> | <A href="http://www.nih.gov/">NIH</A>  
</P>  
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ipubmed7  
--></FONT></P>  
<SCRIPT language=JAVASCRIPT> /* <!-- */ TextFocus (); // -->  
</BODY></HTML>
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FIG. 27

Fzo-like Homologous Sequences

1: BG890612. EST516463 cSTD So...[gi:14267734]

LOCUS BG890612 752 bp mRNA linear EST 07-MAR-2003

DEFINITION EST516463 cSTD Solanum tuberosum cDNA clone cSTD19A23 5' sequence,
mRNA sequence.

ACCESSION BG890612

VERSION BG890612.1 GI:14267734

KEYWORDS EST.

SOURCE Solanum tuberosum (potato)

ORGANISM Solanum tuberosum

Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots;
asterids; lamiids; Solanales; Solanaceae; Solanum.

REFERENCE 1 (bases 1 to 752)

AUTHORS van der Hoeven,R., Bezzerides,J., Ewing,E., Cho,J., Chierning,A.,
Bougri,O., Buell,C.R., Ronning,C., Tanksley,S. and Baker,B.

TITLE Generations of ESTs from dormant potato tubers

JOURNAL Unpublished

COMMENT Contact: Robin Buell

The Institute for Genomic Research

9712 Medical Center Dr, Rockville, MD 20850, USA

Email: potato-array@tigr.org

This clone can be obtained from the University of Arizona Genomics
Institute. Orders can be made through URL:

<http://genome.arizona.edu/orders/>

Seq primer: M13F-R.

FEATURES Location/Qualifiers

source 1..752

/organism="Solanum tuberosum"

/mol_type="mRNA"

/cultivar="Kennebec"

/db_xref="taxon:4113"

/clone="cSTD19A23"

/tissue_type="dormant tuber"

/dev_stage="one month post-harvest"

/lab_host="SOLR"

/clone_lib="cSTD"

/note="Vector: pBluescript SK(-); Site_1: EcoRI; Site_2:

XhoI; This library targets genes expressed in dormant

tubers. This library was made from sections of dormant

tuber, avoiding the buds and epidermis. Tubers were stored

161

Fig. 27, continued 2/6

for one month post-harvest at 40C. The tuber was peeled, well away from the surface. Then it was chopped into 1-2 mm cubes and immediately frozen in liquid nitrogen. This library is noted as P4 in Tanksley lab notebooks."

BASE COUNT 226 a 144 c 172 g 210 t

ORIGIN

```
1 gcgaatgtga ttctcaaag gcaacaaagg ctgacggagg aatttggcc tcgtgcagat
61 ctgcttctgt ttctcatgct tgctgatcga ccattaactg aaagtgaggt tagtttctg
121 cgttacactc agcagtgagg taagaaggct attttggc tgaacaagtc tgacatatac
181 aagaataacg gcgagttgga ggaggccatt gcattatca aaaaaatac acggaaattg
241 ctgaatacag aatccgtaac actgtatcca gtatctgcac ggctcgctct tgaatcaaag
301 ctttctactt ttgatggcgc ccttagtcaa aacaatggga gttcaataa tgatttcac
361 tggaaaacca agagcttcta tgagcttgag aagtacttgt ctgcttttt ggattcatcc
421 acaagtactg gaattgagag aatgaagctg aagcttgaaa ctccaattgc cattgcagaa
481 caactacttt tagcttgca aggacttggt agacaagaat gtcagcaagc caaacaagac
541 ttgctgtttg ttgaggatct tgtcaacagc gtagaagagt gcacaaagaa gctggaagtt
601 gatagcattc tgtggaagag gcaggttcta tctctgataa actctgctca agcacgtgtt
661 gtccggcttg tagagtcaac gttacaactg tcaaatgttg atctgtcgc tacatatgta
721 ttcagaagag aaaactctac tcaaatgcc a gc
```

//

2: AW760673. sl53d10.y1 Gm-c10...[gi:7692570]

Links

LOCUS AW760673 492 bp mRNA linear EST 03-DEC-2001
DEFINITION sl53d10.y1 Gm-c1027 Glycine max cDNA clone GENOME SYSTEMS
CLONE ID:

Gm-c1027-5036 5' similar to SW:YOR6_CALSR P40983 HYPOTHETICAL
PROTEIN IN XYNA 3'REGION ;, mRNA sequence.

ACCESSION AW760673

VERSION AW760673.1 GI:7692570

KEYWORDS EST.

SOURCE Glycine max (soybean)

ORGANISM Glycine max

Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; rosids
; eurosids I; Fabales; Fabaceae; Papilionoideae; Phaseoleae;
Glycine.

REFERENCE 1 (bases 1 to 492)

AUTHORS Shoemaker,R., Keim,P., Vodkin,L., Erpelding,J., Coryell,V., Khanna
,A., Bolla,B., Marra,M., Hillier,L., Kucaba,T., Martin,J., Beck,C.,
Wylie,T., Underwood,K., Steptoe,M., Theising,B., Allen,M., Bowers
,Y., Person,B., Swaller,T., Gibbons,M., Pape,D., Harvey,N., Schurk
,R., Ritter,E., Kohn,S., Shin,T., Jackson,Y., Cardenas,M., McCann
,R., Waterston,R. and Wilson,R.

162

Fig. 27, continued 3/6

TITLE Public Soybean EST Project
JOURNAL Unpublished
COMMENT Contact: Shoemaker R/Public Soybean EST Project
Public Soybean EST Project
Washington University School of Medicine
4444 Forest Park Parkway, Box 8501, St. Louis, MO 63108, USA
Tel: 314 286 1800
Fax: 314 286 1810
Email: est@watson.wustl.edu
This clone is available through: ResGen, Invitrogen Corp. 2130
South Memorial Parkway Huntsville, AL 35801 For further information
call: (800)-533-4363 or contact via email: ccu@resgen.com
Insert Length: 2209 Std Error: 0.00-
High quality sequence stop: 411.
FEATURES Location/Qualifiers
source 1..492
/organism="Glycine max"
/mol_type="mRNA"
/db_xref="taxon:3847"
/clone="GENOME SYSTEMS CLONE ID: Gm-c1027-5036"
/tissue_type="cotyledons of 3- and 7-day-old Williams
seedlings"
/lab_host="DH10B"
/clone_lib="Gm-c1027"
/note="Vector: pBluescript II SK+; Site_1: EcoRI; Site_2:
XhoI; This cDNA library was constructed from mRNA isolated
from cotyledons of 3- and 7-day-old Williams seedlings
which were propagated on paper towels with distilled
water. The cotyledons were flash-frozen in liquid
nitrogen, then lyophilized for 72 hours. Unequal amounts
of mRNA was used for cDNA synthesis. Stratagene's cDNA
Synthexix Kit (catalog number 200401) was used to
synthesize the cDNA. First- stranded synthesis was
performed with 5-methyl dCTP, hence the ligated cDNA was
hemimethylated. A modification of Stratagene's
first-strand synthesis primer was used. An anchor
nucleotide (V=A, C, or G) was added to the 3' end of the
primer [GAGAGAGAGAGAGAGAGAGAACTAGTCTCGAG(T)18] to anchor
the primer at the 5' end of the poly(A) tract. After
second- strand synthesis, the cDNA ends were filled in
with cloned Pfu DNA, ligated to EcoRI adapters and
subsequently phosphorylated. The XhoI site within the
first-strand synthesis primer was then restricted by
digestion with XhoI; all XhoI sites in the cDNA would be
protected by their hemimethylated status. The cDNA
constructs were size-fractionated with a 500 bp cutoff,

Fig. 27, continued 4/6

using GibcoBRL Life Technologies' cDNA Size Fractionation column. The column eluent was then ligated into Stratagene's pBluescript(tm) II XR Predigested vector (pBluescript II SK(+)) that has been digested with EcoRI and XhoI, and phosphorylated by Stratagene). 97% of the white and blue colonies appear to contain recombinant plasmids with cDNA inserts, based on size (n=30). This library was constructed by Dr. Paul Keim and Dr. Virginia Coryell."

BASE COUNT 135 a 91 c 108 g 158 t

ORIGIN

```
1 tgttgatga agctattgaa gctatcaaga gggctgcacc tctgatggag gaggtttcac
61 ttcttaatga tgcggtttct caaattgatg agccattctt actggttata gtgggggaat
121 tcaactctgg taaatctacc gtgattaatg cgcttcttgg agaaagatat ctcaaagagg
181 gagttgttcc aacaactaat gagatcacat ttttacgata tactgactta gatattgaac
241 aacaacggtg tgaaggcat ccagatggcc aatatatttg ctacattcct gtcceaattc
301 ttaagagat gaccattgtt gatacacctg gaactaatgt gattcttcag aggcagcagc
361 gtcttacaga ggaatttga ccccgtcgag atttacttct tttgtcatt tctgctgac
421 gccctttaac tggaagtgag attgcttttc ttcgttattc tcagcagtgg aaaaagaaag
481 cggcttttgt ct
```

//

3: BE353824. EST355167 tomato ...[gi:9291800]

Links

LOCUS BE353824 446 bp mRNA linear EST 18-MAY-2001

DEFINITION EST355167 tomato flower buds, anthesis, Cornell University

Lycopersicon esculentum cDNA clone cTOD6M4, mRNA sequence.

ACCESSION BE353824

VERSION BE353824.1 GI:9291800

KEYWORDS EST.

SOURCE Lycopersicon esculentum (tomato)

ORGANISM Lycopersicon esculentum

Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;

Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots;

asterids; lamiids; Solanales; Solanaceae; Solanum; Lycopersicon.

REFERENCE 1 (bases 1 to 446)

AUTHORS van der Hoeven,R.S., Bezzeredes,J.L., Matern,A.L., Holt,I.E., Liang

,F., Hansen,T.S., Craven,M.B., Bowman,C.L., Ronning,C.M., Nierman

,W., Fraser,C.M., Martin,G.B., Giovannoni,J.J. and Tanksley,S.D.

TITLE Generation of ESTs from tomato flower tissue, anthesis

JOURNAL Unpublished

COMMENT Contact: CUGI

Clemson University Genomics Institute

Clemson University

Fig. 27, continued 5/6

100 Jordan Hall, Clemson, SC 29634, USA
Email: <http://www.genome.clemson.edu/orders/index.html>
5 prime sequence.

FEATURES Location/Qualifiers
source 1..446
 /organism="Lycopersicon esculentum"
 /mol_type="mRNA"
 /cultivar="TA496"
 /db_xref="taxon:4081"
 /clone="cTOD6M4"
 /tissue_type="flower"
 /dev_stage="anthesis"
 /clone_lib="tomato flower buds, anthesis, Cornell
 University"
 /note="Vector: pBlueScript SK(-); Site_1: EcoR1; Site_2:
 Xho1; supplier: Tanksley; Flower buds and flowers were
 taken from greenhouse plants (4-8 wks old, TA496). They
 were immediately frozen in liquid nitrogen and then
 size-separated while remaining frozen."
BASE COUNT 119 a 82 c 116 g 129 t
ORIGIN
 1 gagaccatta agtacaattc tataagcagt cttttgaaaa aagatggact tcattggtga
 61 atccgtctga ccaaattgag ttaggaacaa ctggtgtgct ggatagaaaa tctgaagta
 121 ccataagtgt catagaggat ttcagtgtg cagctgcttc aaaattgctt gagagagata
 181 ttctgaagt gttcttgggt acctttgggt gtcttggagc agctggttta tcagcgtcgc
 241 ttctgacatc tgttctcaa accacattag aagacctct tgcacttggc cttgttctg
 301 ctggcgggtt attagcggtc ttcaactct catcccgag acagcaagt gtagataaag
 361 taaagaggac tgcgatggc ctttcacgtg aactogaaga ggctatgcag aaggagctct
 421 tggagacgac tagtaatgtg gaggac
//

4: BI136291. F066P17Y Populus ...[gi:18017219]

Links

LOCUS BI136291 521 bp mRNA linear EST 31-DEC-2001
DEFINITION F066P17Y Populus flower cDNA library Populus balsamifera subsp.
 trichocarpa cDNA, mRNA sequence.
ACCESSION BI136291
VERSION BI136291.1 GI:18017219
KEYWORDS EST.
SOURCE Populus balsamifera subsp. trichocarpa
 ORGANISM Populus balsamifera subsp. trichocarpa
 Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
 Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; rosids
 ; eurosids I; Malpighiales; Salicaceae; Populus.

165

Fig. 27, continued 6/6

REFERENCE 1 (bases 1 to 521)

AUTHORS Hertzberg,M., Aspeborg,H., Erlandsson,R., Bjorkbacka,H., Hiltonen
,T., Karlsson,J., Teeri,T., Gustafsson,P., Bahlerao,R., Jansson,S.,
Nilsson,O., Sundberg,B., Nilsson,P., Uhlen,M., Sandberg,G. and
Lundeberg,J.

TITLE Gene expression in Populus

JOURNAL Unpublished

COMMENT Contact: Erlandsson R

Department of Biotechnology

Royal Institute of Technology

Teknikringen 30, Stockholm S-10044, Sweden

Tel: 46 8 790 8287

Fax: 46 8 245452

Email: rikerl@biochem.kth.se.

FEATURES Location/Qualifiers

source 1..521

/organism="Populus balsamifera subsp. trichocarpa"

/mol_type="mRNA"

/sub_species="trichocarpa"

/db_xref="taxon:3694"

/clone_lib="Populus flower cDNA library"

/note="Organ: flower"

BASE COUNT 143 a 87 c 135 g 156 t

ORIGIN

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121 tgcattaaat gcgtctaatt ctgaaggtgc tgattttctt atatatgttc atggcccaga
181 ggatgacct gatgtagaaa tgagccctgg attcggaat gtgaagatac caatctttgt
241 cctcaatgct tcacgtgggg aggacacatt gtcggtgggg gcatcaaaat ttctgaaaac
301 cgggtgtagt ggtttagttc tgcattgga agattgagg ttatttagcg atgatgcttt
361 gaggcagatg ttgacactc tgagtgaac cggtaaaaac tticaggatg acctgaaag
421 cttcagtaag ctcaaatcta tggatatgga aaatgatatt catgaaaaaa caacggtggc
481 aggcctttgt aaactggagg atagagaaaa acagctcata g